

**EVALUATION OF RIGHT ILIAC FOSSA MASS:**

**A RETROSPECTIVE STUDY**

**Dissertation submitted to**

**THE TAMILNADU Dr. M. G. R. MEDICAL UNIVERSITY**

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**M. S. GENERAL SURGERY (BRANCH I)**



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**THE TAMILNADU Dr. M. G. R. MEDICAL UNIVERSITY**

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## **CERTIFICATE**

This is to certify that this dissertation titled **“EVALUATION OF RIGHT ILIAC FOSSA MASS - A RETROSPECTIVE STUDY”** has been prepared by **DR. S. SANKAR**, under my supervision in the Department of General Surgery, Chengalpattu Medical College, Chengalpattu, during the academic period 2010 – 2013, and is being submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai, in partial fulfillment of the University regulation for the award of the Degree “Master Of Surgery” (M. S., General Surgery) and his dissertation is a bonafide work.

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## **INTRODUCTION**

Right iliac fossa mass may arise from parietal wall or intraperitoneum or retroperitoneum. Mass may arise from right iliac regional structures or extended from adjacent structures.

## **VARIOUS CAUSES FOR RIGHT ILIAC FOSSA MASS**

**PARIETAL WALL MASSES:** Lipoma, Desmoid tumor, pyogenic abscess and haematoma, iliac or appendicular abscess burrowing into abdominal wall.

**INTRAPERITONEAL MASSES:** Appendicular abscess or mass, Ileocaecal tuberculosis, carcinoma caecum, mesenteric adenitis, iliac nodes, typhilitis , crohn's disease, actinomycosis , distended gallbladder, ovarian cysts, fibroid uterus , tubo-ovarian mass, occasionally intussusception, amoeboma, diverticular disease.

**RETROPERITONEAL MASSES:** Sarcoma, aneurysm, psoas abscess, undescended testis, unascended kidney and tumour from ilium and cartilage.

Appendicular pathology is commonest cause for right iliac fossa mass (either appendicular mass or abscess). Other common causes are ileo-caecal tuberculosis and carcinoma caecum.

Appendicular mass is formed by inflamed appendix adherent with dilated ileum, greater omentum and caecum<sup>(1)</sup>.

Appendicular abscess due to suppuration in an acute appendicitis or suppuration in an already formed appendicular mass <sup>(1)</sup>.

Abdominal tuberculosis is common in developing countries like India. It is sixth most common type of extra pulmonary tuberculosis. Its incidence is high in HIV infected patients <sup>(2)</sup>. Ileo-caecal tuberculosis is commonest type of abdominal tuberculosis due to presence of Peyer's patches and stasis of luminal contents favoured by ileo-caecal valve.

Commonest type of carcinoma in caecum is adenocarcinoma. Third common site in large bowel carcinoma (12%). Diet with lack of fibres and high fat increases risk. Dietary vitamins A, C, E (antioxidants) and Zinc and high fibre diet reduce the risk.

Diagnosis of right iliac fossa mass mainly depends on complete clinical examination, radiological, biochemical, microbiological and pathological investigations. Commonest cause of right iliac fossa mass in our country is appendicular mass or abscess, ileo-caecal tuberculosis and carcinoma caecum.

## **OBJECTIVE OF THE STUDY**

To study the aetiology, pattern of presentation, management and complications in patients with right iliac fossa mass in our institution.

## **REVIEW OF LITERATURE**

Abdomen is divided into nine quadrants by two horizontal and two vertical planes. They are right and left hypochondrium, right and left lumbar region, right and left iliac region, epigastrium, umbilical and suprapubic region.

Right iliac fossa is bounded anteriorly by parietal wall, posteriorly by psoas and quadratus lumborum muscle and thoraco-lumbar fascia. Inferiorly it is bounded by inferior part of ileum and iliacus muscle. Laterally bounded by external and internal oblique muscle, transverse abdominis muscle and fascia transversalis.

Contents of peritoneal cavity in right iliac fossa include terminal ileum, appendix, caecum, ascending colon and its mesentery.

### **ANATOMY OF APPENDIX<sup>(3)</sup>**

Right iliac fossa is related superiorly by right lumbar region, medially by umbilical and suprapubic region. Appendix is located at the terminal end of caecum where three taeniae coli join, about 2 cm below the ileo-caecal orifice. Average length of appendix is about 9cm<sup>(4)</sup>, variable from 2 to 20cm in length of usually around 5 to 10 cm in length. Diameter is about 3 to 8 mm and diameter of lumen is 1 to 3 mm.

Mesoappendix is extension of mesentery containing appendicular artery, a branch of ileo-colic artery. Often an accessory appendicular

artery of Seshachalam may be present. Thrombosis of both these arteries leads to gangrenous appendicitis. Appendicular vein drains into ilio-colic vein to superior mesenteric vein to portal vein. Mesoappendix arises from lower surface of mesentery or the terminal ileum. Four to six or more lymphatic channels traverse the mesoappendix to empty into ilio-caecal lymph nodes. The appendix is present only in human, certain anthropoid apes and wombat. Morphologically it is underdeveloped distal end of large caecum found in many lower animals. It is a blind muscular tube with mucosal, submucosal and serosal layer.

**Various positions of appendix are**

1. Retrocaecal position (74%),
2. Pelvic position (21%),
3. Paracaecal position (2%),
4. Subcaecal position (1.5%),
5. Preileal position (1%),
6. Postileal position (0.5%).

**Histology:** The lumen is irregular, being encroached upon by longitudinal folds of mucous membrane, lined by columnar cells, intestinal mucosa of colonic type, and few crypts are present. In the base of the crypts lie Kulchitsky cells which may give rise to Carcinoid tumors in gastrointestinal tract. Appendix is the most common site of

carcinoid tumor, which may present with appendicitis due to occlusion of lumen. Submucosa contains numerous lymphatic aggregations or follicles. The prominence of lymphatic tissue in the young adults seems to be important in the aetiology of appendicitis.

### **ANATOMY OF CAECUM<sup>(3)</sup>**

Caecum is a blind pouch of large intestine projecting downward from the commencement of the ascending colon, below the ileo-caecal wall. It is usually completely covered by peritoneum. Appendix may lie in the retrocaecal recess formed by two longitudinal folds of peritoneum from medial and lateral side of posterior side of caecum. The longitudinal muscle of caecum is concentrated into three flat bands the taeniae coli, within which is the circular muscle layer of the sacculated wall. The taeniae coli lie on anterior, posteromedial and posterolateral; all three converge on the base of appendix.

Caecum lies on the peritoneal floor of the right iliac fossa, over the iliacus and psoas fasciae and femoral and lateral femoral cutaneous nerves. Its lower end lies at the pelvic brim on distension, the anterior surface of caecum touches the anterior abdominal wall, parietal peritoneum, on collapsing coils of ileum lie between caecum and anterior abdominal wall. Anterior and posterior caecal arteries fan out from the respective surfaces of the caecum; both these arteries are branches of the ileo-caecal artery. The posterior caecal artery is larger



and gives a branch to the base of the appendix. There are corresponding veins lymph passes to the nodes associated with the ilioecolic artery and reach superior mesenteric nodes. Parasympathetic nerve supply is from vagus, sympathetic from T10 to L2.

### **ANATOMY OF ILEUM<sup>(3)</sup>**

Ileum is narrow bored and thin walled than jejunum. Anti-mesenteric border of the terminal ileal mucosa consisted whitish elongated plaques of aggregated lymphoid follicles. These are called Peyer's patches. Ileum lies coiled in the lower part of infracolic compartment. Total length of jejunum and ileum is about 4 to 6 meters length, three fifth of is formed by ileum. Meckel's diverticulum is present in 2% of individuals. 60 cm from the caecum and 5cm in length. Variable in length and its site may be more proximal to caecum also.

Blind end of Meckel's diverticulum may contain gastric mucosa or liver or pancreatic tissue, ulceration and perforation of tip can occur. It represents the intestinal end of vitellointestinal duct. Numerous ileal branches of arteries arise from the left side of superior mesenteric artery and enter the mesentery by passing between the two layers of the root. The ileal arteries arch form larger series of arcades, three to five , the most distal lying near the ileal wall, so that the straight vessels branches, if the arcades shorter. The end of the superior mesenteric artery itself supplies the region of the Meckel's diverticulum, if present

and anastomosis with the arcades and with the ileocolic branch to supply the terminal ileum. The veins corresponding to the arteries drain into superior mesenteric vein.

Ileal lymph drains to superior nodes via mural and intermediate nodes in the mesentery. Autonomic nerves reach the wall of the small intestine with its blood vessels. The parasympathetic supply is from vagus. Sympathetic supply is from T9 to T10 spinal segments.

### **ANATOMY OF ASCENDING COLON<sup>(3)</sup>**

This is the first part of colon, extending from Caecum to hepatic flexure, measuring about 15 cm in length, related to ventral surface of liver and inferior surface of right kidney, lies over iliac and lumbar fascia. Ascending colon consists of three taeniae coli. These are outer longitudinal muscle fibres, lying anterior, posteromedial and posterolaterally. Appendices epiploicae is a feature of ascending colon. These are distended out pouch of peritoneum with fat. Blood supply of appendices epiploicae is through perforators. Mucous membrane herniation through this can cause diverticulosis.

Anterior, posterior and medial surface of ascending colon is covered by peritoneum. Blood supply is from ileocolic and right colic artery. These are branches of superior mesenteric artery. Veins corresponding to the arteries reach portal vein through superior mesenteric vein. Through posterior abdominal wall there is some amount of porto-systemic

anastomosis found in ascending colon. Lymphatics follow ileocolic and right colic arteries, drains into superior mesenteric nodes. Sympathetic supply is from lateral horn of T10 to L2, parasympathetic supply is through vagus.

### **ILEO-CAECAL VALVE <sup>(3)</sup>**

This is situated between terminal ileum and caecum. Ileocaecal junction is guarded by this valve. Transverse lip of this valve prevents some reflux into ileum from caecum. But sphincteric action of this valve is very weak <sup>(5)</sup>. Ileocaecal valve produces stasis of luminal contents in the ileum.

### **ANATOMY OF ANTERIOR ABDOMINAL WALL IN RIGHT ILIAC FOSSA.**

From superficial to deep: Skin, subcutaneous layer-(superficial fatty, deep membranous layer), External oblique muscle aponeurosis, internal oblique muscle, Transverse abdominis muscle, Fascia transversalis, and Parietal peritoneum.

### **ANATOMY OF RETROPERITONEUM**

Retro peritoneum is the space between posterior abdominal wall and peritoneal cavity.

#### **Boundaries of retro peritoneum.**

Anterior - posterior parietal peritoneum.

Posterior - Vertebral column, psoas muscle, quadratus lumborum muscle, transversus abdominis muscle;

Superior - Diaphragm.

Inferior - Pelvic levator muscles.

**Contents of retroperitoneum in right iliac fossa:**

1. Right common iliac artery and vein,
2. Right external iliac artery and vein,
3. Lymph nodes situated along with above mentioned vessels,
4. Thorocolumbar fascia,
5. Retroperitoneal connective tissue,
6. Iliopsoas muscle and its sheath.

**DIFFERENTIAL DIAGNOSIS OF MASS IN THE RIGHT ILIAC FOSSA:**

**A. Causes for Parietal wall swelling.**

**1. Tumours-**

Common benign tumours are Lipoma, Fibroma, Neurofibroma and fibromatosis.

Malignant tumours (rare) are Desmoid tumour, Soft tissue sarcomas (fibrosarcoma, dermatofibrosarcoma, liposarcoma).

**2. Parietal wall haematomas <sup>(6)</sup>.**

**3. Abdominal wall abscess.**

- a. Infected haematoma or pyogenic abscess,

- b. Iliac abscess burrowing into abdominal wall,
- c. Appendicular abscess burrowing into abdominal wall.

**4. Incisional hernia** (post appendectomy).

**B. Intraperitoneal swelling (origin from right iliac fossa region organs).**

- 1. Appendicular mass and abscess,
- 2. Ileocaecal tuberculosis,
- 3. Carcinoma caecum,
- 4. Mesenteric lymph nodes,
- 5. Typhylitis (amoebic),
- 6. Crohn's disease,
- 7. Actinomycosis,
- 8. Intussusception,
- 9. Mesenteric cyst,
- 10. Diverticulosis.

**Origin from other regions but extends to right iliac fossa region.**

- 1. Distended gall bladder,
- 2. Diverticulum of urinary bladder,
- 3. Pelvic abscess,
- 4. Gynaecological conditions ovarian or uterine pathology.

**RETROPERITONEAL (SWELLING) CAUSES include** Soft tissue sarcoma, Aneurysm, Iliopsoas abscess, Tumor from bony or cartilage

of ilium, Undescended Testis, Unascended Kidney, Retroperitoneal lymph nodes, (a.tuberculosis or filariasis, b. Retroperitoneal lymphoma, c. Secondary carcinoma) and Transplanted kidney.

### **PARIETAL WALL TUMORS.**

1'. Common tumors are lipoma, fibroma, neurofibroma, and neurofibromatosis.

2. Malignant tumors arise from Skin or soft tissues. They are desmoid tumor or soft tissue sarcomas. Desmoid tumor arises from musculoaponeurotic layer of the lower abdomen. It is an unencapsulated hard fibroma, currently classified under aggressive fibromatosis. Commonly occur in women (80%), arises from old scars or haematomas. Desmoid tumour may also associate with Gardner's syndrome. This slow growing tumor involves muscle and soft tissues, locally spreading, undergoes myxomatous changes, but never turns into Sarcoma. Histologically it contains multinucleated plasmodial giant cells.

### **INVESTIGATIONS**

1. Routine blood investigations and X-ray abdomen,
2. USG / CT scan abdomen with pelvis is diagnostic,
3. FNAC/Biopsy is essential investigation.

### **TREATMENT;**

1. Benign tumours - Excision,

2. Malignant tumours - Wide excision of the tumor with 2.5 cm margin is done with Mesh placement to the abdominal defect,
3. Desmoid tumor is moderately radiosensitive. Medical treatment with Sulindac and Tamoxifen <sup>(7)</sup> are used. Recurrence rate is 20%.

### **PARIETAL WALL HAEMATOMA**

Anterior abdominal wall is mainly supplied by superior and inferior epigastric vessels. Injury to these arteries will cause bleeding and parietal wall haematoma. It is commonly due to rupture of inferior epigastric artery in the lower abdomen <sup>(6)</sup>. Commonest causes are trauma, surgery, spontaneous haematoma, enteric fever, blood dyscrasias, haemophilia, anticoagulant treatment, severe straining, pregnancy and puerperium.

**Clinical features;** common in females, sudden onset, involves lower abdomen, firm, and warmth, tender and does not cross the midline. Skin over swelling is bluishly discoloured; confirmation of diagnosis is by ultrasound abdomen, CT abdomen and aspiration <sup>(6)</sup>.

#### **Treatment:**

Conservative treatment with antibiotics and analgesics. Huge haematomas are more prone for infection hence require evacuation of haematoma and ligation of inferior epigastric artery <sup>(6)</sup>.

### **ABDOMINAL WALL ABSCESS**

Infected haematomas and blood borne infections from distant focus are common causes. Tender, soft to firm, well localized swelling, adherent to skin and deep muscle. Needle aspiration and USG abdomen are confirmatory.

**Treatment:** Incision and drainage under anaesthesia with systemic antibiotic coverage.

### **VENTRAL HERNIAS**

Right iliac fossa ventral hernias are rare, occurs from lower abdominal transverse incisional scars or injury of the iliohypogastric nerve during open appendicectomy. Investigations are USG abdomen, chest x-ray and relevant tests for causes. Surgery is the treatment of choice for ventral hernias.

### **VERMIFORM APPENDIX**

#### **Historical review**

First appendicectomy was done by Claudius Amyand in 1736<sup>8</sup>. The appendix was identified as an organ capable of causing disease in 1824 by Louyer villermay.<sup>8</sup> The term appendicitis was coined by Reginald fitz<sup>8</sup>.

First surgical treatment for appendicular abscess, abscess drainage without appendicectomy was done by Hancock in 1848<sup>8</sup>. First article published “account of appendicectomy for appendicitis” by Kronlein in 1886.



First elective appendicectomy was done by Fergus in 1883. Mcburney published an article describing the indications for early laparotomy for the treatment of appendicitis in 1889.<sup>8</sup> First laparoscopic appendicectomy was done by Semon in 1982.

## **APPENDICITIS**

It is common in young males and white races. Commonly occurs in May to August month. In infants and children localization does not occur, hence perforation and peritonitis are common due to shorter omentum. In elderly, lax abdomen and poor localization can lead to gangrene and perforation.

### **Aetiology;**

Obstructive appendicitis is due to faecolith, foreign body, round or thread worms and carcinoma caecum, crohn's disease and abuse of purgatives. 30% of cases are found in first degree relatives. High fibre diet prevents appendicitis.

Pseudo-appendicitis; Appendicitis due to crohn's ileitis or ileitis followed by Yersinia infection.

### **COMMON ORGANISMS;**

Escherichia coli 85%, Enterococci 30%, Streptococci 40%, Pseudomonas 20%, anaerobic Bacteroides 80%, Streptococci, Clostridium welchii, Bilophila wadsworthia.

**Table; 1. COMMON ORGANISMS SEEN IN PATIENTS WITH ACUTE APPENDICITIS<sup>8</sup>**

<b>Aerobic and facultative</b>	<b>Anaerobic</b>
<b>Gram negative bacilli</b>	<b>Gram negative bacilli</b>
Escherichia coli	Bacteroides fragilis
Pseudomonas aeruginosa	Other Bacteroides species
Klebsiella species	Fusobacterium species
<b>Gram positive cocci</b>	<b>Gram positive cocci</b>
Streptococcus anginosus	Peptostreptococcus species
Other streptococcus species	<b>Gram positive bacilli</b>
Enterococcus species	Clostridium species

### **Pathogenesis;**

Acute inflammation of mucus membrane with serosal inflammation without luminal obstruction is called non obstructive acute appendicitis. It may lead to resolution, fibrosis or recurrent appendicitis or obstructive appendicitis. Obstruction is caused by faecolith, lymphoid hyperplasia, worm infestation, foreign body, regional ileitis (crohn's or yersinia infection).

Lymphatic and venous obstructions are common in obstructive appendicitis, followed by thrombosis of appendicular artery<sup>9</sup>. Ischemia of appendix leads to gangrene, followed by perforation of tip or base and peritonitis. After an attack of obstructive appendicitis, inflammation rarely subsides, mucous collects in the lumen and forms mucocele of appendix.

After perforation of appendix, localization of suppurative pus by covering of omentum and dilated ileum and caecum forms appendicular abscess.

Severe appendicitis without perforation, localization occurs by omentum and ileum without suppuration with pus inside forming appendicular mass.

Repeated attacks of non-obstructive appendicitis leads to fibrosis and adhesions called recurrent appendicitis or chronic appendicitis.

**Clinical features;** Anorexia followed by pain, nausea and vomiting and raised temperature. Pain - visceral pain starts around the umbilicus due to distension of appendix, followed by pain in the right iliac fossa, few hours later, and somatic pain due to parietal peritoneal irritation. Nausea and vomiting occurs due to pylorospasm. Pyrexia; after 6 hrs. of attack, pyrexia of about  $37.2^{\circ}\text{C}$  to  $37.7^{\circ}\text{C}$  in adults,  $37.2^{\circ}\text{C}$  to  $38.5^{\circ}\text{C}$  in children, with pulse rate between 80 to 90/ min is usual.

**Murphy's Triad;** Pain, Vomiting, Fever.

Constipation, or diarrhea, urinary frequency usually occurs in pelvic, Pre-ileal or post-ileal positional appendicitis.

**TABLE-2.SIGNS OF APPENDICITIS<sup>9</sup>**

Signs	Descriptions
Pointing sign	Migration of pain from umbilicus to RIF
Rovsing's sign	Pain in RIF when LIF is pressed
Psoas sign	Extension of right hip increases pain in retrocaecal appendicitis
Baldwing's sign	Increase of pain on raising the right lower limb with an extended knee, in retrocaecal appendicitis
Obturator sign	Increase of pain during internal rotation of right hip in pelvic appendicitis
Bastede sign	RIF tenderness in left lateral position
Aaron sign	Epigastric pain and distress on pressure over Mcburney's point
Blumberg's sign(release sign)	Rebound tenderness in RIF
Dunphy's sign	Pain in RIF on coughing
Alder's sign	To diagnose appendicitis in pregnancy. uterine pain shifts with change of patient's position, while appendicular pain does not shift

**Investigations:**

**Complete blood count**-elevated white blood cell count in 75% of patients.

**Total count** of > 25,000 indicates gangrenous appendicitis or perforated appendicitis. **Urine analysis** is helpful to exclude urinary tract

infection, urinary calculi and pyelonephritis. **Raised C-reactive protein.**

**Abdominal radiography:** Calcified faecolith is visible in about 10 to 15% of acute appendicitis. X-ray abdomen is useful for detection of intestinal obstruction, hollow viscus perforation, urinary calculi, from appendicitis. **Barium enema-** Barium does not fill lumen due to inflammation, but it is unreliable. **Ultrasound Abdomen;** 85% sensitivity and 90% specificity. Non compressible appendix of size about >7mm anteroposterior diameter, faecolith, submucosal discontinuity and periappendiceal fluid collection or mass may be seen. **Contrast CT scan;** Useful if diagnosis is difficult, especially in old people. Dilated appendix and lumen, thickened wall and non-filling of the lumen by contrast, periappendicular fluid collection or presence of mass or abscess or associated pathology like neoplasm may be identified. **Nuclear scan;** Tc99 labeled WBC and Tc99 labeled gammaglobulin are used in study. Localization of WBC or gamma globulin by scintigraphy.<sup>10</sup>

**Laparoscopy;** Useful as diagnostic and therapeutic in inconclusive patients.

**Alvarado's Scoring System <sup>9</sup>:** A score of greater than or equal to 7, strongly suggestive of acute appendicitis. A score of 5 to 6 is equivocal; and <5 is doubtful, require CT or Ultrasound like imaging modalities.

**Table: 3. ALVARADO'S SCORING SYSTEM**

Symptoms	Score
Migratory RIF pain	1
Anorexia	1
Nausea & vomiting	1
Signs	
Tenderness (RIF)	2
Rebound tenderness	1
Elevated temperature	1
Laboratory	
Leukocytosis	2
Shift to left leucocyte count	1
Total	10

**Treatment;** Open or laparoscopic appendicectomy. Commonly Gridiron's or Lanz skin crease incision <sup>11</sup> are used. When diagnosis is doubtful or peritonitis is present, prefer lower midline or lower right paramedian incision.

**Procedure**<sup>11</sup>; under general anaesthesia or regional anaesthesia, skin is incised. Both superficial and deep layers of subcutaneous tissue are cut. External and internal oblique, transverses abdominis muscle are split in the line of fibres and peritoneum opened. Caecum identified by taeniae and ileo-caecal junction. Appendix held with Babcock's forceps. Mesoappendix with appendicular artery is ligated and purse string suture is placed around the base of appendix. After transfixing the base,

distal part of appendix is amputated. Drain kept if necessary. Laparoscopic appendicectomy was done at many centres nowadays.

### **APPENDICULAR MASS**

It is localization of infection, occurring 3to5 days after an attack of acute appendicitis. Inflamed appendix and greater omentum, caecum, peritoneum and distal ileum forms a mass in right iliac fossa.<sup>11</sup> Appendicular mass is tender, smooth, firm, localized, non-mobile, well defined borders and resonant on percussion. Appendicular mass is confirmed by high leucocyte count, ultrasound abdomen and pelvis.

**Treatment;** Conservative Ocshner –Sherren regimen is the treatment of choice for appendicular mass. Half hourly pulse, BP, I/O chart, Nil per oral with nasogastric tube aspiration, Intravenous fluids and parenteral analgesia.

Broad spectrum antibiotic along with anaerobic covering by parenteral route.

Marking the mass to watch for progression or regression.

Response to conservative treatment is assessed by regaining appetite, reduction in size of mass, pulse and temperature becoming normal within 2to3 days. About 90% respond to conservative treatment, while 15% may develop recurrent appendicitis. Hence interval appendicectomy is advised after 6 weeks.

### **Indications for Emergency Surgery in Appendicular Mass:**

1. Persistent hyperpyrexia with tachycardia,
2. Persistent vomiting with increased nasogastric aspiration,
3. Increased size of mass or spread of pain abdomen (onset of diffuse peritonitis)

### **APPENDICULAR ABSCESS**

Failure of resolution of appendicular phlegmon mass or suppuration in an acute appendicitis with persistent pyrexia indicates abscess formation. Commonly abscess occurs in retrocaecal or pelvic region. But can occur at subcaecal, pre-ileal or post-ileal region. Clinically patients will have high fever and toxic symptoms, smooth, soft, tender, dull percussive mass in the right iliac fossa region. Ultrasound abdomen and CT scan will confirm the diagnosis.

**Treatment** ; Less than 4 to 6cm size of appendicular abscess can be treated conservatively<sup>12</sup>. More than 4to 6cm size abscess is drained by extra peritoneal approach and drain kept. Pelvic abscess can be drained per rectal or by posterior colpotomy in female patients. Interval appendicectomy can be done after 3 months. Less than 4to 6 cm abscess, not responding to antibiotic therapy, persistent fever and toxic symptom, all can be drained.<sup>12</sup>



**Postoperative complications of appendicectomy include** Reactionary haemorrhage, Paralytic ileus, Residual abscess, Adhesive intestinal obstruction, Wound sepsis, faecal fistula, Respiratory tract infection, DVT, Right inguinal hernia and incisional hernia and Portal pyemia .

### **NEOPLASMS OF APPENDIX<sup>12</sup>**

It is a rare condition. Commonest neoplasms are carcinoids, adenocarcinoma, mucinous neoplasm and lymphoma. Most of the appendicular neoplasms present as acute appendicitis. Diagnosis can be made from histopathological examination after appendicectomy.

### **ILEOCAECAL TUBERCULOSIS**

Abdominal tuberculosis is common in developing countries like India. It is the sixth common type of extra-pulmonary tuberculosis and high incidence in HIV infected patients.

#### **Mode of infection;**

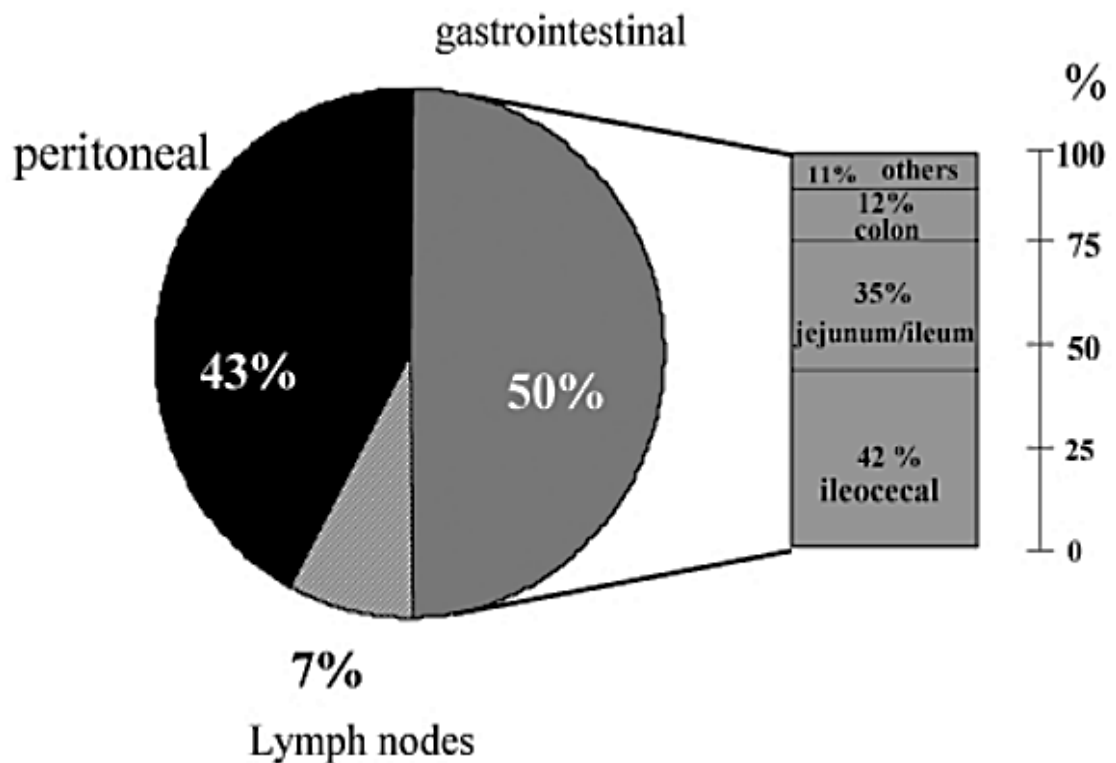
1. Ingestion of contaminated food with tubercle bacilli causes primary intestinal tuberculosis.
2. Ingestion of infected tubercle bacilli containing sputum can cause secondary intestinal tuberculosis.
3. Haematogenous spread from pulmonary tuberculosis.
4. Lymphatic spread through tuberculous cervical adenitis.
- 5 . Retrograde spread through genitourinary tract in females.

Intestinal tuberculosis is otherwise called as “Koenig’s syndrome”. Ileocaecal region and ileal region is commonly affected. Oesophagus and gastroduodenal region is rarely affected, other rare variety is diffuse tuberculous colitis.

### ILEOCAECAL TUBERCULOSIS

Male to female ratio is 1:1. Age group affected is 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> decade. This is the most common type of abdominal tuberculosis due to presence of abdominal Peyer’s patches and stasis of luminal contents. Older theory is due to *Mycobacterium bovis* and latest theory states *Mycobacterium tuberculosis* as cause.

**Table.4: Incidence of various types of abdominal tuberculosis**



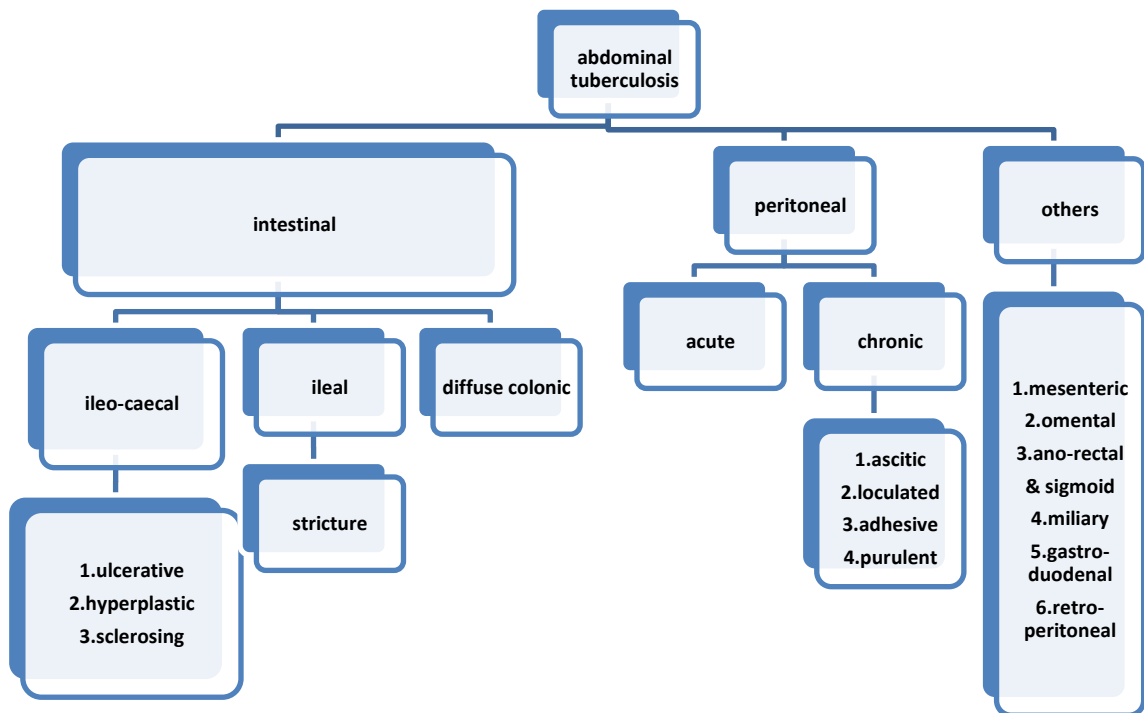
### **Types of Ileocaecal Tuberculosis;**

1. Ulcerative type, 2. Ulcero hyperplastic type, 3. Hyperplastic type.

**Ulcerative type** <sup>13</sup>; this is commonly due to secondary pulmonary tuberculosis, due to swallowing of bacilli containing sputum. High virulent bacterial infection commonly affects terminal ileum. Host resistance is very poor. Multiple transverse ulceration in the terminal ileum with bowel wall thickening, hence perforation is rare. Hemoptysis, diarrhea and emaciation are commonest feature of ulcerative type of intestinal tuberculosis. Commonest complication is stricture.

**Hyperplastic type** <sup>13</sup>; Primary intestinal tuberculosis due to *Mycobacterium bovis* and low grade *Mycobacterium tuberculosis* infection. These less virulent infection affect the ileo-caecal region. Host resistance is significant. Chronic infection involving the ileo-caecal region resulting in cicatrizing granuloma in right iliac fossa. Abdominal pain and diarrhea are common symptoms. Common complication is intestinal obstruction.

**Table.5 VARIOUS PRESENTATIONS OF ILEO-CAECAL TUBERCULOSIS**



## Investigations

- 1.Chest x-ray – to find out pulmonary tuberculosis.
- 2.Mantoux test, ELISA, SAFA (Soluble antigen fluorescent antibody).
- 3.Raised ESR and lymphocytosis.
- 4.Ultrasound<sup>14</sup> abdomen to find out ascites, caecal wall thickening, nodal status and other solid organs.
5. CT Scan with oral contrast;<sup>14</sup>

Useful to rule out bowel wall thickening, ileo-caecal valve and peritoneal thickening, nodal status and cold abscess and loculated Ascites.

6. Abdominal x-ray; Shows intestinal obstruction, calcification of bowel wall or node or liver granuloma and air under diaphragm in case of hollow viscus perforation.

7. Barium study x-ray finding<sup>14</sup>;

a. Pulled up caecum, obtuse ileo-caecal angle seen in hyperplastic type of lesions.

b. Fleischner sign; narrow ileum with thickened

Incompetent ileo-caecal valve is seen in ulcerative type of disease.

c. Ulcers and strictures in the terminal ileum and caecum<sup>13</sup>.

d. Multiple strictures with dilatation of proximal ileum.

8. Colonoscopy shows

a) Mucosal nodules or ulcers.

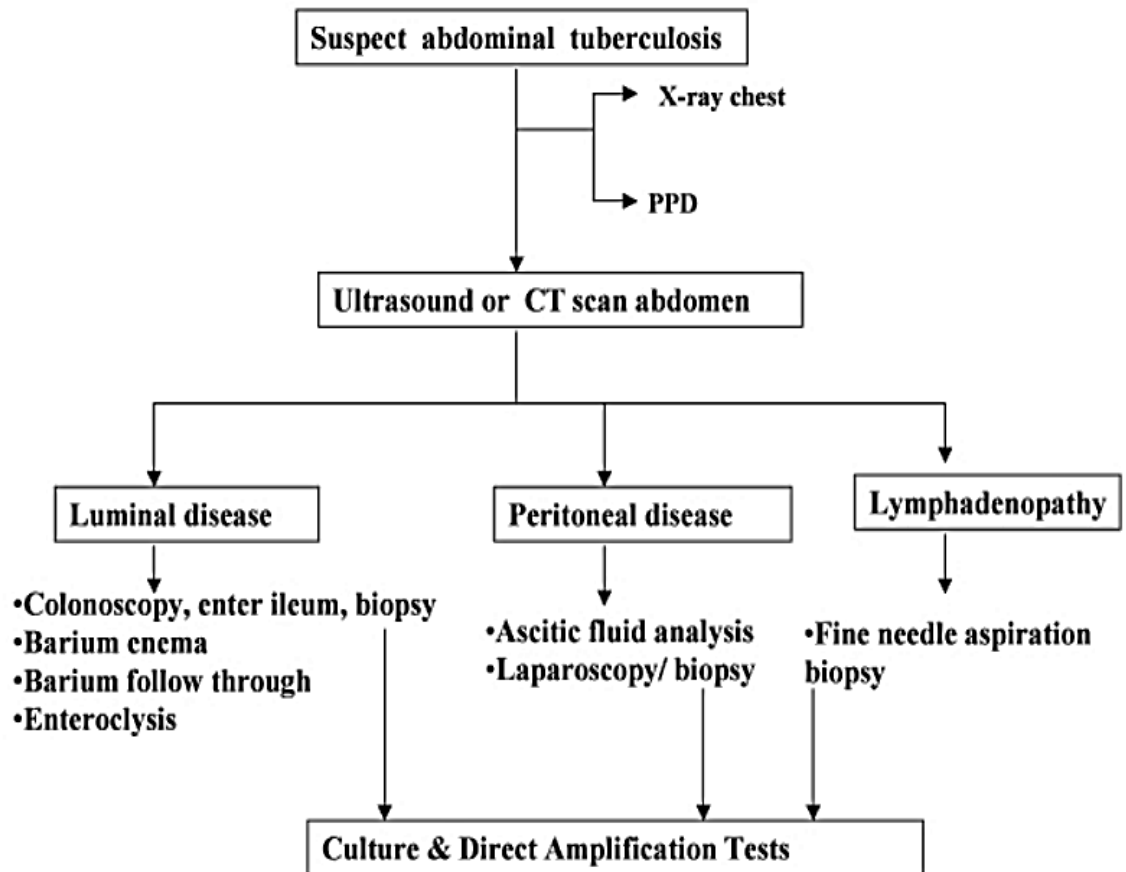
b) Caecal and ileal strictures with incompetent deformed ileo-caecal valve.

c) Mucosal edema and pseudo polyps and rarely colitis.

d) Biopsy may be taken to confirm the diagnosis.

9. PCR study of biopsied tissue or ascitic fluid and ascitic fluid analysis and biochemical assay of ADA and interleukins and laparoscopic study with biopsy are other useful investigations.<sup>14</sup>

**Table.6: Evaluation of Abdominal Tuberculosis**



**TREATMENT;** Medical management of ileo-caecal tuberculosis is anti-tubercular treatment. First line drugs used are;

**Intensive Phase** for 2 months<sup>15</sup>.

1.T.Isoniazid 600 mg, 2.C.Rifampicin 600mg, 3.T.Pyrazinamide 1500mg, 4.T.Ethaambutol 1200mg. above drugs are given as weekly thrice regimen for two months.

**Continuation Phase;** for 4 months or 6 months<sup>15</sup>. T. Isoniazid 600 mg and C. Rifampicin 600 mg are given thrice a week along with

Pyridoxine supplementation. In drug resistant cases second line drugs are used.

## **SURGICAL MANAGEMENT**

### **Indications for surgery-**

1.Acute intestinal obstruction due to stricture or hyperplastic lesion due narrowing of lumen<sup>16</sup>, 2.Perforation or severe hemorrhage like acute condition ,3.Intraperitoneal abscess or fistula formation<sup>16</sup>, 4.Doubtful diagnosis where malignancy cannot be ruled out.

Surgeries are done under anti-tubercular treatment coverage.

**1. Complete intestinal obstruction;** Right hemicolectomy with ileocolic anastomosis with post-operative ATT for 6 to 9 months<sup>13</sup>.

### **2.Strictures;**

a) Single stricture - stricturoplasty.

b) Multiple strictures at long intervals - stricturoplasty.

c) Multiple strictures within short segments - Resection anastomosis is the ideal treatment.

**3. Perforation of ileum;** after biopsy, resection and anastomosis is the ideal treatment.<sup>17</sup>

**4.Poor general condition with acute obstruction;** Initial ileocolic bypass and right hemicolectomy with ileocolic anastomosis done after improving general condition.

**5. Laparoscopy:** Adhesiolysis or drainage of abscess for selected patients.

Postoperative complications of ileo-caecal tuberculosis included Wound infection and sepsis, Anastomotic leak and faecal fistula, Respiratory complications, DVT and Adhesive intestinal obstruction.

### **CARCINOMA CAECUM**

Common type of carcinoma is adenocarcinoma<sup>18</sup>. Occasionally adenosquamous or squamous carcinoma can occur. Caecum is the third most common site of large bowel malignancy, followed by rectum and sigmoid colon.

#### **Aetiology ;**

1. DIET - Red meat, saturated fat and cholesterol increases bowel luminal bile acid, hence prone for malignancy.
2. Alcohol and smoking increases the risk.
3. Radiation promotes mucinous type of carcinoma.
4. Aspirin and other NSAIDs, calcium are protective against large bowel cancers<sup>19</sup>.
5. Genetic causes;
  - a. Adenoma colon or Familial Adenomatous polyposis coli.
  - b. Gardner's syndrome and Turcot's syndrome.
  - c. Peutz jeger's syndrome and Juvenile polyposis syndrome.



6. Post-cholecystectomy and ileal resection and ureterocolostomy status are more prone for colonic carcinoma.

7. Intraepithelial E.coli and Helicobacter pylori are also associated with colorectal cancers.

Hereditary nonpolyposis colonic cancer: Autosomal dominant, non-polyposis colonic cancer. Two consecutive generations and at least 3 family members are affected.

a. Lynch syndrome 1 - It commonly affects young age and right side of colon, metachronous presentation.<sup>18</sup>

b. Lynch syndrome 2: Colonic cancer associated with gastric, breast, endometrial or ovarian or urinary bladder cancers.

## **PATHOLOGY**

**Macroscopic appearance:** Colorectal cancers are classified as

1. Polypoidal 2. Ulcerative, 3. Annular, 4. Mucinous.

**1. Polypoidal type;** Arises in the form of fungating mass, more common on the right side of colon and has got best prognosis.

**2. Ulcerative type;** It arises as a typical malignant ulcer with raised everted edges and a necrotic base. It is common in left sided colon and has got intermediate prognosis.

**3. Annular type;** It arises as lesion encircling the colonic lumen, probably arises from a malignant ulcer that gradually extends all around the bowel wall. It produces obstructive features.

**4. Mucinous or colloid carcinoma;** Bulky tumor with a gelatinous appearance. It has worst prognosis.

**Microscopic appearances;** Majority of colorectal cancer is adenocarcinoma. It is classified as

1. Well differentiated type - has good prognosis.
2. Intermediately differentiated type - intermediate prognosis.
3. Poorly differentiated type - has worst prognosis.

This classification is based on cellular atypia, mitotic rate and attempts of gland formation.

**Histopathological staging ;** this is carried out in resected specimen to obtain an estimate of prognosis. Main advantages of histopathological staging are;

1. Gives the surgeon and the patient, the estimate of likely long term prognosis.
2. Guide to the usefulness of adjuvant therapy.
3. Gives comparison between results of different forms of treatment and different units.

**Mode of spread;**

1. Spread by local extension, 2. Lymphatic spread, 3. Haematogenous spread, 4. Spread through body cavities. Intramural spread occurs in three dimensions, longitudinal, transverse and radial axes through the bowel wall.

**Clinical features;** Commonly occurs in 6<sup>th</sup>,7<sup>th</sup>,8<sup>th</sup> decade. Male to female ratio is 3:2.<sup>18</sup>

**Symptoms;** 1. Most common presenting symptom is lower abdominal pain,

2. Altered bowel habits usually presents as alternative constipation and diarrhea in left sided colonic cancer.3. Right sided colonic cancer presents late as the tumor can reach a large size without pain or altered bowel habits but commonly associated with iron deficiency anaemia, 4.Commonest emergency presentation are intestinal obstruction and colonic perforation. Perforation occurs through tumor site, closed loop obstruction due to competent ileo-caecal valve, prone for caecal perforation and faecal peritonitis, 5.Right sided colonic cancer rarely presents with bleeding per rectum or malena.

**Physical signs;** 1. Majority of right sided colonic cancer patients won't have any physical signs. Few cases have a primary tumor mass and hepatomegaly, 2. Advanced cases have left supraclavicular lymphadenopathy, 3. Patients have pallor, jaundice and cachexia.

**Investigations;**

**1.Blood investigations-**

a. Complete blood count commonly indicates iron deficiency anaemia

b. Liver function tests indicate advanced metastatic disease.

c. Carcinoembryonic antigen<sup>20</sup>; Serum levels of carcinoembryonic antigen is raised in about 60% of colorectal cancer patients. This is owing to lack of specificity and sensitivity. But raising CEA level over a period of time, is an important indicator of recurrent disease.

## **2.Endoscopy;**

a. Rigid sigmoidoscopy – useful for diagnosis of accurate level of rectal and sigmoidal growth and biopsy can be taken.

b. Flexible sigmoidoscopy - useful for examination of sigmoid and descending colon. About three fourth of colorectal tumor is within the reach of flexible sigmoidoscopy.

## **3. Colonoscopy<sup>21</sup>;**

This is the gold standard investigation for both cancers and adenomatous polyps. It has high sensitivity and specificity. It has the advantage of allowing biopsy and polypectomy over barium enema.

## **4. Radiological investigation;**

Double contrast barium enema is the most widely used method of investigation of large intestine. Large cancers show typical apple core deformities in barium enema study. It has 1.1 to 7% false positive and false negative results due to tortuous sigmoid colon, diverticular disease and spasm in caecum.

## **Staging investigations;**

- a. X-ray chest-useful to rule out metastatic pulmonary disease.
- b. External liver ultrasound; detects liver metastasis in about 85% patients. Recently intraoperative contact ultrasound of liver is most useful for detecting liver metastasis.
- c. CT scan is useful to rule out liver metastatic disease and to assess the operability of disease.

**Table.7:TNM staging of colorectal carcinoma.**

Stage	Definition
Tx	Cannot be assessed
T0	No evidence of cancer
Tis	Carcinoma in situ
T1	Tumor invades submucosa
T2	Tumor invades muscularis propria
T3	Tumor invades muscularis propria into serosa or into non peritonealised pericolic or perirectal tissues
T4	Tumor directly invades other organs or tissues or perforates the visceral peritoneum of specimen
<b>Nodal stage</b>	
Nx	Regional lymph node cannot be assessed
N0	No lymph node metastasis
N1	Metastasis to 1 to 3 pericolic or perirectal lymph nodes
N2	Metastasis to 4 or more pericolic or perirectal lymph nodes
N3	Metastasis to any lymph node along a major named vascular trunk
<b>Distant metastasis</b>	
Mx	Presence of distant metastasis cannot be assessed
M0	No distant metastasis
M1	Distant metastasis is present

- d. MRI - extremely sensitive method to detect liver metastatic disease.

5.Screening; Occult faecal blood test is one of the important screening test but with a significant false positive and false negative results.

Colonoscopy is an impractical method of screening cancer caecum.

**Treatment;** Carcinoma of caecum is curable disease but early diagnosis and treatment is essential for 5 year survival.

The most appropriate method of obtaining local control of colonic tumor is radical excision of affected segment of bowel along with its vascular pedicle and accompanying lymphatic drainage. Acceptable surgical procedure for carcinoma caecum is right hemicolectomy<sup>22</sup>.

Right Hemicolectomy consist removal of terminal 30 cm of ileum ,caecum and appendix , ascending colon, right 1/3<sup>rd</sup> of transverse colon ( upto right branch of middle colic artery) , with adequate lymph vascular clearance with ileo-transverse anastomosis<sup>22</sup>.

In inoperable right sided growth ileo-transverse anastomosis is done as a bypass procedure. Carcinoma colon involving other structures may be possible for a curative resection by en bloc removal of tumor along with affected structures like ureter, kidney, duodenum, stomach or small bowel or ovary<sup>22</sup>.

### **Surgery for Liver Metastasis**

1. In solitary liver secondary, segmental hepatic resection is done<sup>23</sup>.
2. In case of multiple liver secondaries, confined to one lobe, hemihepatectomy is treatment of choice

3. Metastasectomy done in solitary secondary or one lobe secondaries or less than three metastases in both lobes without any extra hepatic spread. In synchronous growths or growths with other area having multiple potential polyps, resection of involved segment of colon with colorectal anastomosis can be done.<sup>23</sup>

### **Surgery for Obstruction:**

Occasionally a caecal growth will cause a small bowel obstruction. In this condition, emergency ileostomy was done with second stage procedures.

### **Minimal Access Surgery:**

Minimal access surgery in the form of endoscopic polypectomy or tumour excision & laparoscopic assisted colonic resections for colorectal cancers.

**Postoperative complications of carcinoma caecum include** Haemorrhage, Intra peritoneal infection like intra peritoneal abscess and pelvic abscess, Anastomotic leak and faecal fistula, Respiratory complications, Wound infection, DVT, Wound dehiscence and burst abdomen.

## **CHEMOTHERAPY**

1. Currently the standard adjuvant chemotherapy consists of 5-fluorouracil & folinic acid. Low dose folinic acid acts as a potentiator of 5-fluorouracil.
2. In failure of 5-FU therapy, trial with topoisomerase inhibitor-Irinotecan for palliation.
3. Capecitabine an oral prodrug which generates 5-FU at tumour tissue shows better results than 5-FU therapy.
4. Monoclonal antibody Cetuximab blocks EGFR, Bevacizumab blocks VEGF.

Chemotherapy may be given systematically or regionally through the hepatic artery catheter or portal vein for liver secondaries.

## **RADIOTHERAPY:**

It is useful for palliation of locally advanced tumor, infiltration of abdominal wall or psoas muscle infiltration or inoperable recurrent tumours.

## **PROGNOSIS**

1. Right sided colonic tumours has a worst prognosis as they progress to advanced stage than left sided growths.
2. Mucinous carcinomas has worst prognosis.
3. Liver/lymphatic metastasis has worst prognosis.



4. Adequately treated stage I disease has got 95to100% 5 years survival. Once disease spreads through serosa, 5 yrs survival falls to 40-60%, if lymphatic metastasis is present 5 yrs survival falls to 30-40%.

**Unusual type of caecal malignancies;** Squamous cell carcinoma is extremely rare and may be related to squamous metaplasia of pre-existing adenomas or carcinomas. Chronic ulcerative colitis, schistosomiasis and radiotherapy are other predisposing factors.

**Carcinoid tumours;** most common site for carcinoid tumors in gastrointestinal tract is appendix, followed by small bowel. Large intestine is the third most common site. These tumors are slow growing , polypoidal in nature, remaining asymptotic for longer periods.

**Malignant lymphomas;** Third most common variety of colonic malignancy, following adenocarcinoma and carcinoid tumors, but represents about 15% of all colonic growths. Common sites are caecum and rectum. Tumors are usually of Non-Hodgkin's type<sup>24</sup>. It is treated with chemotherapy alone. Surgical treatment should follow only when there is no response to non -surgical therapy.

**Sarcomas;** Various types of sarcomas can occur in colon, presenting in same way as adenocarcinoma. Commonly Kaposi's sarcoma is associated with Human immunodeficiency virus infection. About 25% of such sarcoma is seen at gastrointestinal tract and skin. This presents as

inflammatory bowel disease. Kaposi's sarcoma is treated with chemotherapy and radiotherapy, surgery is rarely required.

### **CROHN'S DISEASE**

It is usually possible to make definitive diagnosis of crohn's by employing combination of histological and clinical features.

**Histological features:** Transmural inflammatory infiltration is present in crohn's disease. Presence of non-caseating granuloma is the pathognomonic feature of crohn's disease.

**Clinical features:** Crohn's colitis may be segmental involvement and rectal sparing disease. Commonly associated with small bowel involvement and multiple perianal fistulas and sepsis. Common site is terminal ileum. Mesentery is thickened, oedematous with enlarged lymph nodes, classified as mild, moderate and severe disease.

**Etiology:** Idiopathic, but familial, infective nature, increased autoantibodies and diet, food allergy, focal ischemia as a vasculitis and Mycobacterium paratuberculosis infection may be predisposing factors. Smoking is associated with relapse and exacerbations.

**Pathology;** Transmural inflammation, Non-caseating giant cell granuloma with linear snake like ulcers with cobble stone like mucosa. Cicatrisation and scarring, Thickening of bowel wall (Hose pipe pattern), Adhesions, Fistula formation.

**Investigations;**

1. Plain x-ray abdomen, Ultrasound abdomen with pelvis, CT scan and CT fistulogram, Colonoscopy are vital investigations for diagnosis of crohn's disease,

2. Barium meal follow through findings are as:

a. Multiple defects showing cobble stone appearance.

b. Cicatrisation of ileum showing string sign of Kantor.

c. Rose thorn appearance of bowel wall.

d. Strengthening of valvulae conniventes.

3. Blood investigations- reveal anaemia, hypoproteinemia, loss of minerals and trace elements and raised C- reactive protein level.

4. Laparoscopy- useful to diagnose and treat crohn's disease.

## **Treatment**

**Medical therapy;** Steroids play main role in treatment. Prednisolone 20 to 40 mg /day for 3 to 6 weeks or Methylprednisolone infusion can be given initially.

Azathioprine and 6-Mercaptopurine and Cyclosporine are used for maintenance therapy. Antibiotics are used for control of sepsis. 5-Amino salicylic acid inhibits interleukins, leukotriene. TNF and prolactin in small and large bowel mucosa. Monoclonal antibody infliximab acts against

tumor necrosis factor alpha. Anaemia , hypoproteinemia, minerals, and minor elements loss may be corrected by supplementation and diet.

**Surgery;** surgery is to correct complications, but not to correct the disease. Post-operative azathioprine to prevent relapse of disease. Ileocaecal resection <sup>25</sup> is common procedure done for crohn's disease. Segmental resection gives better results. Total colectomy and ileo-rectal anastomosis is the treatment of choice, if whole large bowel is involved, sparing rectum. Stricturoplasty, temporary ileostomy and right hemicolectomy is done for appropriate cases.

Appendicectomy should not be done in course of disease, if done they are more prone for enterocutaneous fistula formation.

## **AMOEBOMA**

Infective form of *Entamoeba histolytica* is cyst, enters gut through faeco-oral route. This cyst forms trophozoite which multiplies, causes inflammation and flask shaped ulcers in the terminal ileum, caecum and rectosigmoid region.

**Clinical features;** Blood and mucus diarrhoea and toxemia, fulminant colitis, secondary bacterial infection and extra-intestinal amoebiasis. Commonest extra-intestinal form of amoebiasis is amoebic liver abscess. Chronic amoebiasis causes abdominal pain, reduced appetite, abdominal

colic and psychological trauma to the patient. Commonly tenderness is present in left iliac fossa, hence called amoebic point.

**Amoebic typhilitis** presents as pain and tenderness in right iliac fossa and often as mass in the right iliac fossa, mimicking carcinoma caecum or ileo-caecal tuberculosis called as amoeboma or amoebic granuloma. This inflammatory response to amoebic mucosal invasion is present in less than 2% of patients.

**Types of amoeboma** are;

A mass caused by an intense inflammatory reaction to a deep penetrating ulcer in the colonic wall. This is the commonest type. Fibrolipomatous type where whole thickness of large bowel wall is involved. It is a rare type. An amoeboma is unencapsulated, full of trophozoites<sup>26</sup>.

**Investigations:** Saline wet mount of fresh stools and Polymerase chain reaction and indirect haemagglutination test are common investigations.

**Treatment:** 1. In severe cases, hospitalization and intravenous metronidazole is treatment of choice. 2. Chronic cases are treated with metronidazole 750 mg thrice daily for 10 days. 3. Commonly used other drugs are Diloxanate furoate, Paromomycin and Iodoquinol.

## ACTINOMYCOSIS

It is caused by anaerobic gram positive fungal like bacterium *Actinomyces israeli*<sup>27</sup>. It is a branching filamentous organism, hence otherwise called as 'Ray fungus.'

### **Clinical types;**

1. **Facio- cervical;** it is a normal commensal in oral cavity. Infection spreads commonly either from tonsil or infected tooth.

2. **Thoracic**<sup>27</sup>; Lungs and pleura get infected by direct spread from pharynx or by aspiration.

3. **Abdominal actinomycosis;** It is rare and commonly follows infection with *actinomyces israeli* following perforated appendicitis. Infection spread through psoas muscle and abdominal wall, with adjacent organs forming fistulas and multiple purulent discharging sinuses. Liver is infected through portal circulation resulting in multiple intercommunicating loculated liver abscess formation. (honey comb liver).

**Clinical features;** Patient presents few weeks later following perforated appendicitis surgery, with a fixed indurated mass in right iliac fossa with abscess and multiple discharging sinus<sup>28</sup> formation. No lymph nodal involvement. Ileocaecal actinomycosis was reported in 1892 by Ramson.

**Investigations;**

1. Microscopy of pus shows branching filaments.
2. Gram staining shows- gram positive mycelia at centre with radiating peripheral gram negative filaments.
3. Cultured in thioglycate media and heart brain infusion agar<sup>27</sup>.

**Treatment;**

1. Treatment is conservative with prolonged penicillin and Lincomycin therapy.
2. Other drugs used are Dapsone, Iodides, Tetracycline and Streptomycin.
3. Surgical debridement is occasionally required.

It is one of the important differential diagnoses in inconclusive cause of right iliac fossa mass patients.

**MESENTRIC TUBERCULOUS LYMPHADENITIS**

Infection of mesenteric tuberculous adenitis is usually through peyer's patches of the ileum, through oral cavity. Multiple nodal involvement is present. Commonly right sided nodes are involved.

**Commonest presentations** are; Acute or chronic mass in right iliac fossa.

Massive enlargement of tuberculous mesenteric nodes.

Cold abscess formation within mesentery. Commonly seen in paediatric age group. Associated with anaemia, fever and weight loss.

**Investigations;**

1. Abdominal x-ray shows calcified lesions.
  2. Ultrasound abdomen and Mantoux test are other investigations.
  3. Diagnostic laparoscopy is useful in tuberculous mesenteric adenitis.
- Mesenteric cold abscess can be drained through laparoscopy.

**Treatment;** Antituberculous drugs.

Laparoscopy and proceed if necessary.

Other common causes are Carcinoma caecum, Carcinoid of appendix, other appendicular pathologies, and non-specific mesenteric adenitis.

## **MESENTRIC CYSTS**

Types of mesenteric cysts are chylolymphatic cysts, enterogenous cysts, congenital remnant cysts, teratomatous dermoid cyst, traumatic mesenteric haematoma and cyst formation, mesenteric cold abscess formation and hydatid cyst of mesentery.

**Chylolymphatic cyst;** It arises from congenital maldeveloped lymphatic system. This is commonest type. Commonly seen in ileum. Thin



endothelial wall cyst containing lymph or chyle. It is commonly unilocular and solitary cyst. It has independent vascularity.

**Enterogenous type;** This arises from duplication or diverticulum of adjacent bowel. It is thick walled cyst containing all layers of bowel, receives its blood supply from adjacent bowel<sup>29</sup>.

**Clinical features;**

**1.Tillaux's triad;**

1. Soft, smooth swelling in the umbilical region. 2. Freely mobile in a direction perpendicular to the direction of mesenteric attachment. 3. Zone of resonance in front of cyst.

2. It is common in 10 to 20 yrs of age. Presents with complications like torsion, rupture, haemorrhage in the cyst and infection.

**Investigations;** Plain x-ray abdomen and Barium meal x-ray.

Ultrasound abdomen and CT scan abdomen and pelvis is diagnostic.

**Treatment;**

As chylolymphatic cyst has independent blood supply, enucleation of cyst without bowel resection is possible.

Enterogenous cyst; Removal of cyst along with resection of adjacent bowel is essential, because blood supply is from adjacent bowel.

Other rare intraperitoneal causes of right iliac fossa mass are Meckel's diverticulum, diverticular disease of colon, dilated gall bladder. Intussusception is a common cause of right iliac fossa mass in pediatric age group .

### **COMMONEST GYNECOLOGICAL CAUSES IN RIGHT ILIAC FOSSA MASS.**

1. **Ovarian cyst**<sup>30</sup>; Arises in pelvis, smooth surface with round borders and can be pushed back into pelvis.
2. **Tubo-ovarian mass**<sup>30</sup>; Tender mass arises from pelvic infection, bilateral mass felt in few cases, soft to firm in consistency. History of leucorrhea may be present.
3. **Fibroid uterus**; Firm to hard mass in suprapubic region. Commonly associated with history of menorrhagia or dysmenorrhoea.

### **RETROPERITONEAL CAUSES**

**ILIAC LYMPHADENITIS**; Common in bare foot walking patients, mostly nonspecific and when it is right sided, it simulates an appendicular abscess. Tender, soft to firm palpable swelling above inguinal ligament. Often inguinal lymph nodes are unaffected. Suppuration of this nodes leads to retroperitoneal abscess formation. There may be focal infection in the lower limb or perineum.

**Acute iliac lymphadenitis**-caused by staphylococci and streptococci.

**Chronic specific lymphadenitis** due to filariasis or tuberculosis. Macroscopically nodes may be swollen, grey red, enlarged with perinodal tissue inflammation. Histologically, prominence of germinal centre and lymphoid follicles is present.

**Treatment:** In non-specific cases, suitable antibiotic is given for 3 weeks.

In filarial lymphadenitis, diethyl carbamazine in dose of 12mg/kg body weight in two divided doses for a period of 3 weeks is to be given.

If aspirated material or biopsy proves tuberculosis, start antituberculous drug therapy, with good nutrition and good health care.

**RETROPERITONEAL LYMPHOMAS:** Lymphoma involving external iliac nodes presents as nodular, firm to hard mass, mainly affects women. On examination, group of nodes may be seen along with hepatosplenomegaly. Pyelography is required to differentiate it from urinary tract pathology.

### **SECONDARIES IN EXTERNAL ILIAC NODES:**

These are hard fixed nodes. Primary may be from perineum, penis, ovary and from cervix.<sup>31</sup>

## **PSOAS ABSCESS**

Cold abscess from Pott's disease gravitates from affected thoracolumbar vertebra to psoas sheath, deep to inguinal ligament upto thigh. Clinical examination and x-ray spine shows gibbus. Cross fluctuation is seen in the abscess across inguinal ligament. Cold abscess arising from sacro-iliac joint may fill up right iliac fossa<sup>32</sup>.

**Treatment;** Improve general health, Antituberculous drug therapy, Wide bore needle aspiration, if failed incision and drainage is another option under cover of antituberculous treatment.

## **ILIAC ABSCESS**

Iliac abscess is due to pyogenic infections. Appendicular abscess is the common differential diagnosis. In appendicular abscess, there is a clear space between abscess and ilium, but in cases of iliac abscess lower border is not felt. Ultrasound and CT scan are investigation of choice.

**Treatment;** Incision and drainage is the main treatment option, under cover of systemic antibiotics.

## **RETROPERITONEAL CYSTS**

Cystic swelling are usually benign in nature and most of them are diagnosed incidentally. They are Cystic lesions originating from developmental remnants of urogenital tract, Mesenteric cysts (intra

peritoneal or extraperitoneal) , Teratomatous cyst and dermoid cysts, Abdominal cystic lymphangiomas<sup>33</sup>, Parasitic cysts.

Abdominal pain is the most common presentation of retroperitoneal cysts. A palpable mass is felt only in 30% of patients. Diagnosis is established by abdominal ultrasonography.

**Treatment** is complete surgical excision to prevent recurrence.

### **RETROPERITONEAL BENIGN SOLID TUMORS**

Most of the solid retroperitoneal tumors are malignant. **Benign retroperitoneal tumors** are only 20%. They are Lipomas, Neurofibroma<sup>34</sup>, neurilemmomas-20%. (male: female ratio 10:3), Leiomyomas, Extra adrenal chromaffinomas, Retroperitoneal mucinous cystadenomas, Haemangiopericytoma - rare vascular tumor.

Main symptom is abdominal pain. Main investigations are CT scan, Ultrasound abdomen, MRI Abdomen and pelvis and Histological examination.

**Treatment** is surgical excision, which has to be complete to prevent recurrence.

### **MALIGNANT TUMORS**

Common malignant retroperitoneal tumors are;

Lymphomas      Congenital neuroblastoma      Soft tissue sarcomas;

( Fibrosarcoma, liposarcoma, rhabdosarcoma, neurofibrosarcoma and malignant nerve cell tumors) , Neoplasms arising from Urogenital ridge.

Congenital neuroblastoma is the most frequent solid neoplasm in infancy.

### **RETROPERITONEAL SARCOMAS<sup>35</sup>**

Retroperitoneal sarcomas present with signs that are similar to retroperitoneal lipoma. Occasionally the tumor by pressure on the colon, causes symptoms of subacute intestinal obstruction. On examination a smooth fixed mass, which is non-tender is palpated.

X-ray, Ultrasound, CT scan , PET scan, MRI scan and Histopathology are investigations of retroperitoneal malignancies.

**Treatment<sup>35</sup>**; Exploratory laparotomy should be performed and when possible, tumor is removed. When removal is not possible, portion of tumor is excised for histology. Complete removal gives better prognosis. Radiotherapy is sometimes useful to prevent or delay recurrence.

Other rare retroperitoneal right iliac fossa masses are unascended right kidney, undescended right testis and transplanted right kidney. They are diagnosed by X-ray abdomen, Ultrasound , CT scan abdomen and pelvis.

Iliac artery aneurysm - rare and occurs in old age, as pulsatile swelling with thrill and bruit.

## **MATERIALS AND METHODS**

This retrospective study was carried out in our institution over a period of two years from OCTOBER 2010 TO OCTOBER 2012. All patients who are provisionally diagnosed to have mass in the right iliac fossa by clinical evaluation are included in the study. All data including age, gender, relevant history, investigations (complete blood count, Blood grouping and Rh typing, HIV I & II, Chest radiograph, Ultrasound abdomen and pelvis, CT Scan abdomen and pelvis, IVP and barium follow through and enema, FNAC, BIOPSY) were done to conclude the final diagnosis and appropriate treatment and postoperative complications and final histopathological reports were recorded in the standard forms.

Cases are selected by following Inclusion and exclusion criteria;

### **Inclusion criteria;**

All the cases admitted with Right iliac fossa mass in our institution.

### **Exclusion criteria;**

Female patients with gynaecological diseases.

Paediatric age group (<12 years) patients with right iliac fossa mass.

## OBSERVATION AND RESULTS

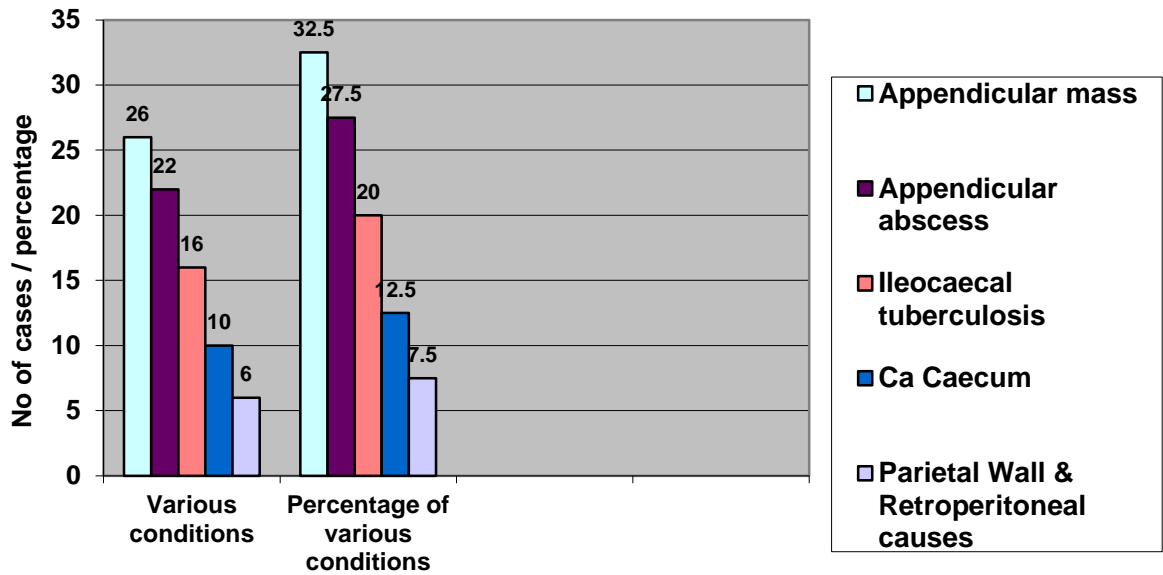
**TABLE 8: INCIDENCE OF VARIOUS CONDITIONS**

<b>Sl.No.</b>	<b>Diagnosis</b>	<b>No of cases</b>	<b>Percentage</b>
1.	Appendicular mass	26	32.5
2.	Appendicular abscess	22	27.5
3.	Ileocaecal tuberculosis	16	20
4.	Ca Caecum	10	12.5
5.	Parietal Wall & Retroperitoneal causes <sup>*</sup>	6	7.5
	Total	80	100

\*Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma.



## Incidence of various conditions

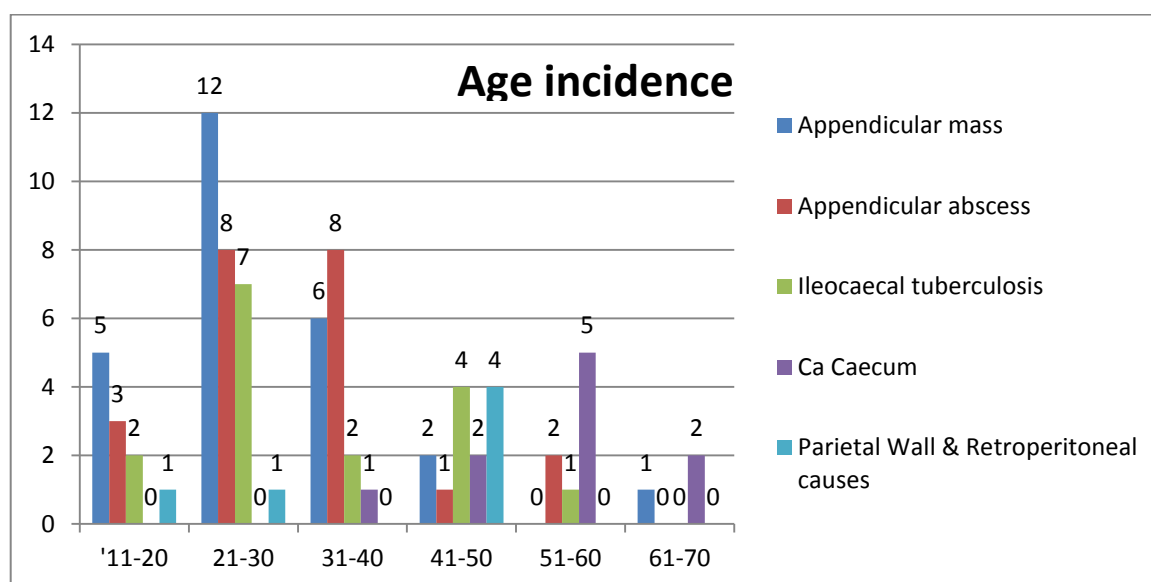


In our study of 80 cases, 60% percent of cases are related to appendicular pathology. 20% of cases are related to ileo-caecal tuberculosis, 12.5% cases are related to carcinoma caecum, 7.5% of cases are related to various type of parietal wall & retroperitoneal causes like Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma . One case of carcinoma caecum was associated with ileo-caecal tuberculosis.

**TABLE 9: AGE INCIDENCE**

Sl. No.	Diagnosis	No of cases	Age in years					
			11-20	21-30	31-40	41-50	51-60	61-70
1.	Appendicular mass	26	5	12	6	2	0	1
2.	Appendicular abscess	22	3	8	8	1	2	0
3.	Ileocaecal tuberculosis	16	2	7	2	4	1	0
4.	Ca Caecum	10	0	0	1	2	5	2
5.	Parietal Wall & Retroperitoneal causes*	6	1	1	0	4	0	0
	Total	80	11	28	17	13	8	3

\*Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma.



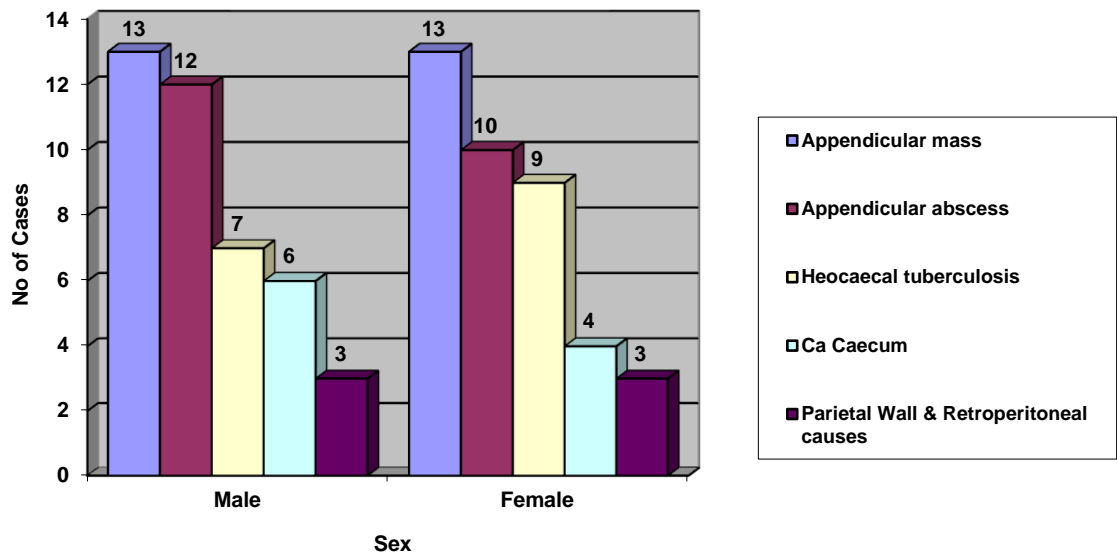
In our study of 80 cases, youngest patient was of age 13 year male, oldest patient was of age 70 year male, common age group was 20 – 50 years (72.5%). Appendicular pathology commonly presented in the 3<sup>rd</sup> decade followed by 4<sup>th</sup> and 2<sup>nd</sup> decade. Ileo-caecal tuberculosis is common in 20 - 50 years of age group, carcinoma caecum is common in 6<sup>th</sup> decade .

**TABLE 10: SEX INCIDENCE**

Sl. No.	Diagnosis	Male		Female	
		No	Percentage	No	Percentage
1	Appendicular mass	13	50	13	50
2	Appendicular abscess	12	55	10	45
3	Ileocaecal tuberculosis	7	44	9	56
4	Ca Caecum	6	60	4	40
5	Parietal Wall & Retroperitoneal causes *	3	50	3	50
	Total	41	51	39	49

\*Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma

## Sex Incidence



In our study of 80 cases, appendicular pathology either appendicular mass or abscess has incidence of 52% in males & 48% in females. In ileo-caecal tuberculosis incidence in males is 44% & in females is 56%. Carcinoma caecum is common in males (60%) than in females (40%). Overall incidence in males is 51% and in females is 49% .

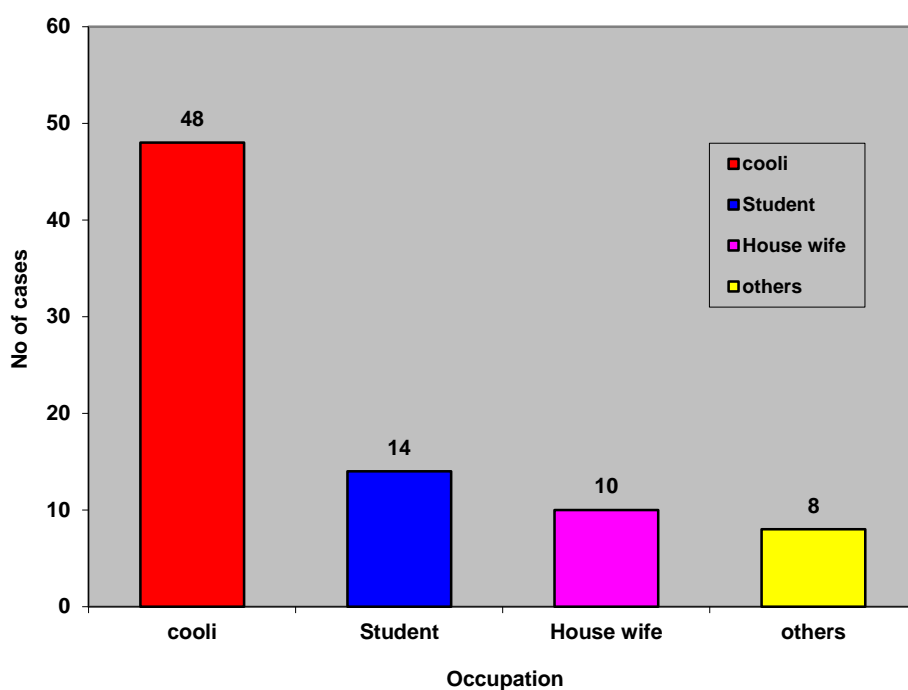
**TABLE 11: SOCIO ECONOMICAL STATUS**

Sl.No.	Occupation	Coolie	Student	House wife	Others	Total
1	No of cases	48	14	10	8	80
2	Percentage	60	17.5	12.5	10	100

Coolie – agriculture . mechanical laborer, and manual workers

In our study 60% of cases have low socio-economic status. Majority of ileo-caecal tuberculosis cases are from low socio-economic status.

### **Socio economic status**

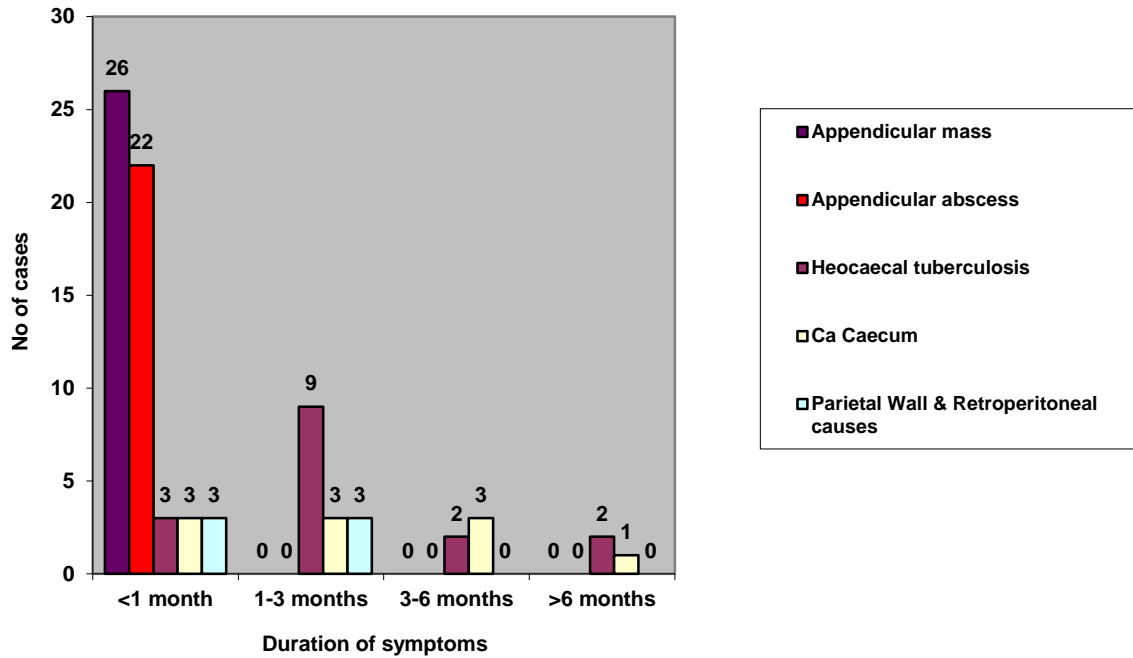


**TABLE 12: DURATION OF SYMPTOMS**

Sl. No.	Diagnosis	Number of cases	Duration			
			<1 month	1-3 months	3-6 months	>6 months
1	Appendicular mass	26	26	0	0	0
2	Appendicular abscess	22	22	0	0	0
3	Ileocaecal tuberculosis	16	3	9	2	2
4	Ca Caecum	10	3	3	3	1
5	Parietal Wall & Retroperitoneal causes <sup>*</sup>	6	3	3	0	0
	Total	80	57	15	5	3
	Percentage	100	71	19	6	4

<sup>\*</sup>Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma

## Duration of symptoms



Duration of illness in appendicular pathology is less than one month. In majority of ileo-caecal tuberculosis, patients had symptoms for 1 – 3 months. In majority of carcinoma caecum, patients had symptoms for 1- 6 months.

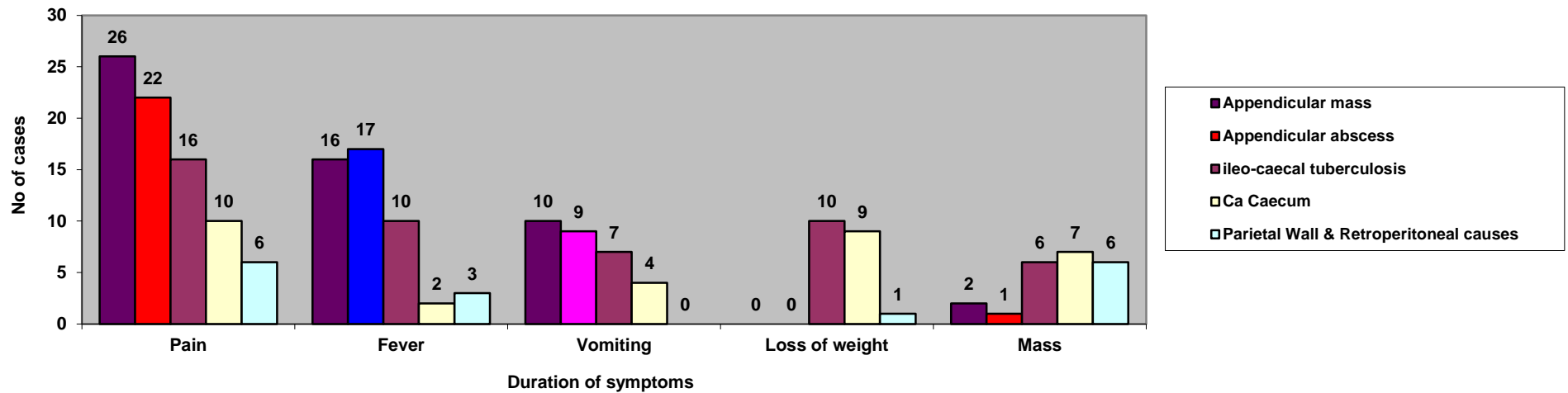
**TABLE 13: SYMPTOMS ( Pain, Fever, Vomiting, Loss of Weight, Mass )**

Sl. No.	Diagnosis	Number of cases	Pain		Fever		Vomiting		Loss of Weight		Mass	
			No	%	No	%	No	%	No	%	No	%
1	Appendicular mass	26	26	100	16	61.5	10	38.5	0	0	2	7.5
2	Appendicular abscess	22	22	100	17	77	9	41	0	0	1	4.5
3	Ileocaecal tuberculosis	16	16	100	10	62.5	7	44	10	62.5	6	37.5
4	Ca Caecum	10	10	100	2	20	4	40	9	90	7	70
5	Parietal Wall & Retroperitoneal causes*	6	6	100	3	50	0	0	1	16.7	6	100
	<b>Total</b>	<b>80</b>	<b>80</b>	<b>100</b>	<b>48</b>	<b>60</b>	<b>30</b>	<b>37.5</b>	<b>20</b>	<b>25</b>	<b>22</b>	<b>27.5</b>

\*Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma



## Duration of symptoms



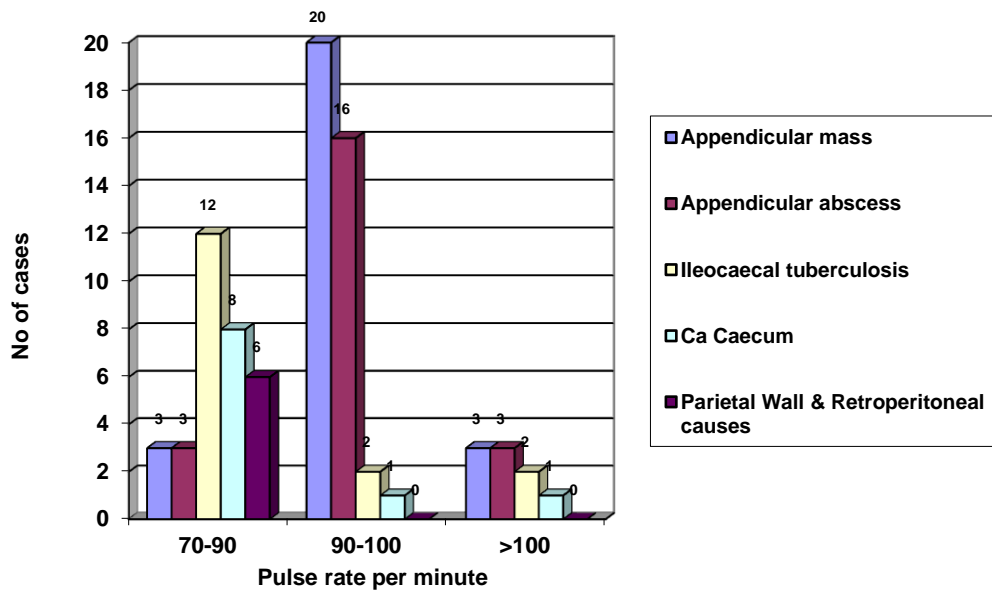
Appendicular pathology patients are associated with pain, fever and vomiting. Majority of ileo-caecal tuberculosis patients are associated with fever and loss of weight & loss of appetite. Majority of carcinoma caecum patients had pain & mass.

**TABLE 14: PULSE RATE AT ADMISSION**

Sl. No.	Diagnosis	No of cases	Pulse rate per minute					
			70-90	%	90-100	%	>100	%
1	Appendicular mass	26	3	11	20	78	3	11
2	Appendicular abscess	22	3	14	16	72	3	14
3	Ileocaecal tuberculosis	16	12	75	2	12.5	2	12.5
4	Ca Caecum	10	8	80	1	10	1	10
5.	Parietal Wall & Retroperitoneal causes *	6	6	100	0	0	0	0
Total		80	32	40	39	49	9	11

\* Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus

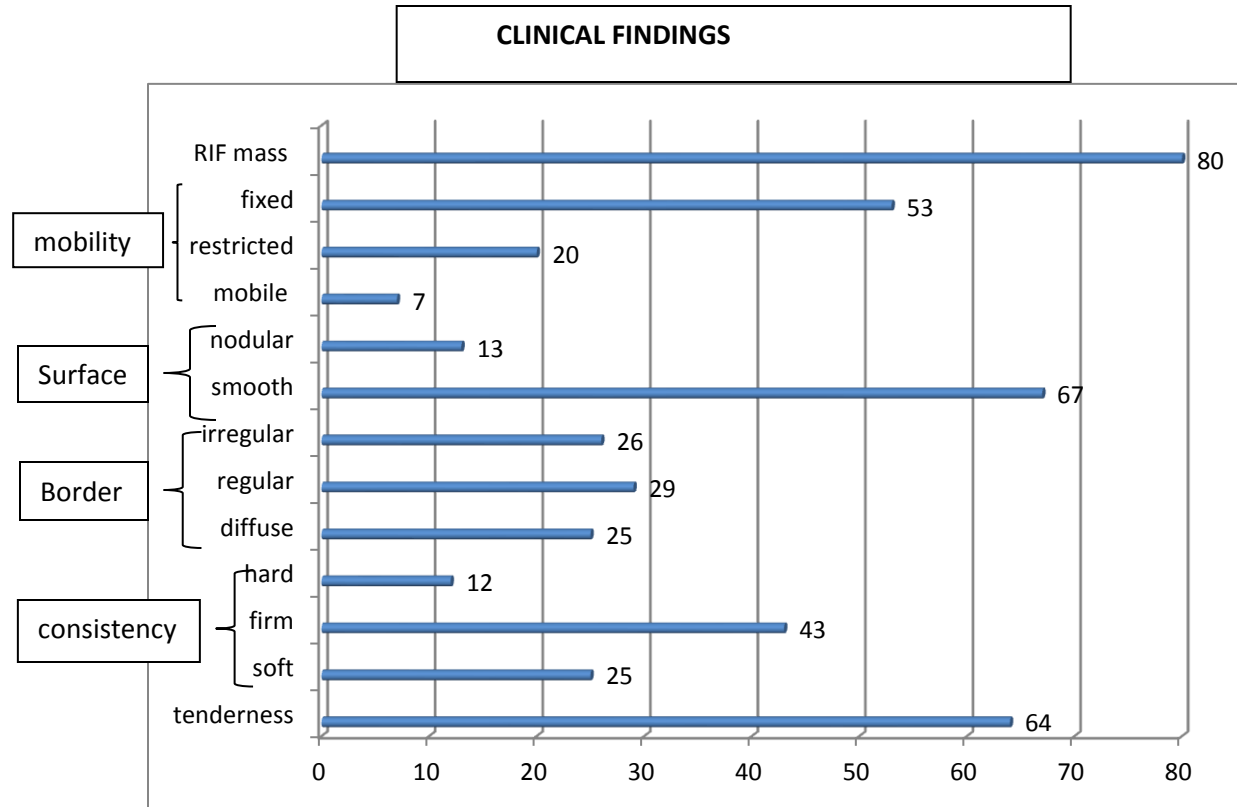
sheath haematoma.



Majority of appendicular pathology patients had tachycardia (90-100/min) at admission.

**TABLE 15: CLINICAL FINDINGS**

<b>Sl.No.</b>	<b>Clinical Findings</b>		<b>No of cases</b>	<b>Percentage</b>
1.	Tenderness		64	80
2.	Consistency	Soft	25	31
		Firm	43	54
		Hard	12	15
3.	Borders	Diffuse	25	31
		Regular	29	36
		Irregular	26	33
4.	Surface	Smooth	67	84
		Nodular	13	16
5.	Mobility	Mobile	7	9
		Restricted Mobility	20	25
		Fixed	53	66
6.	Mass in right iliac fossa		80	100



All cases included in this study had a mass.

Appendicular abscess was soft in consistency with diffuse borders & smooth surface and fixed mass. Appendicular mass was firm in consistency with regular border, smooth surface and fixed mass. Ileo-caecal tuberculosis was firm in consistency with irregular border, smooth or nodular surface and a mobility restricted mass. Carcinoma caecum had a hard mass, irregular border, smooth or nodular surface, restricted mobility and fixed in advanced stage

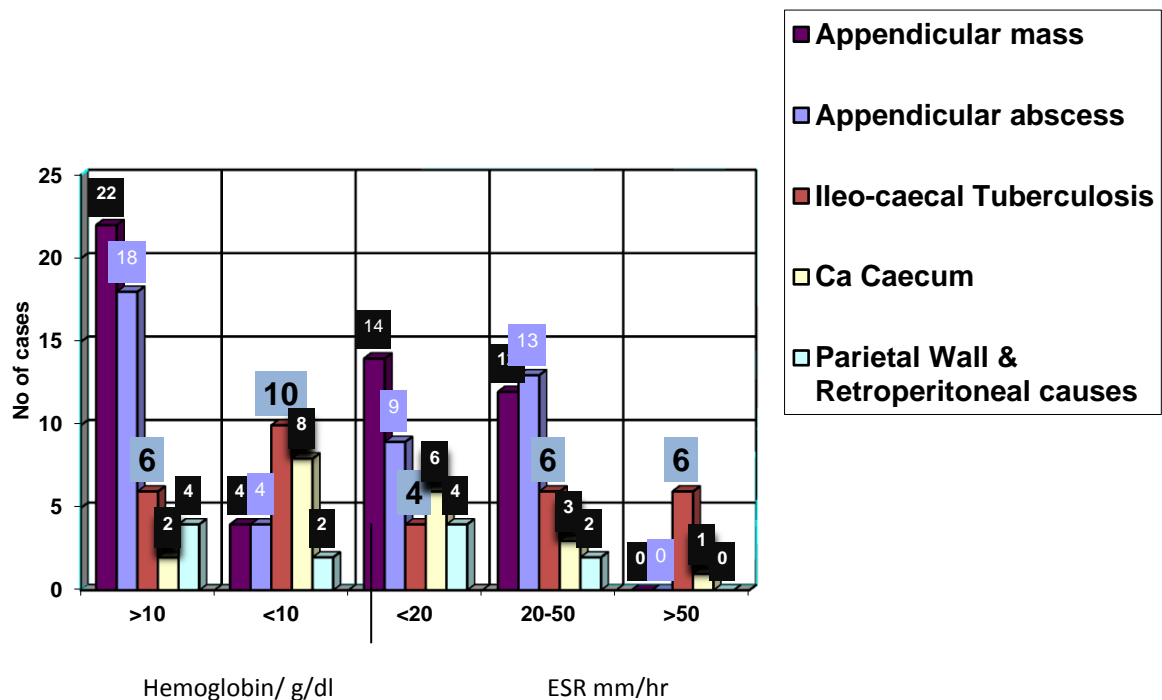
**TABLE 16: HEMOGLOBIN & ESR**

Sl. No.	Diagnosis	No of cases	Hemoglobin (g/dl)		ESR(mm/hr.)		
			>10	<10	<20	20-50	>50
1	Appendicular mass	26	22	4	14	12	0
2	Appendicular abscess	22	18	4	9	13	0
3	Ileocaecal tuberculosis	16	6	10	4	6	6
4	Ca Caecum	10	2	8	6	3	1
5	Parietal Wall & Retroperitoneal causes *	6	4	2	4	2	0
Total		80	<b>52</b>	28	37	36	7
Percentage		100	65	35	46	45	9

\* Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour,

Rectus sheath hematoma

## HAEMOGLOBIN & ESR



In our study 35% of the patients had Haemoglobin less than 10 gm/dl. Majority of ileo-caecal tuberculosis & carcinoma caecum patients had haemoglobin less than 10 mg/dl.

46% of patients had ESR less than 20 mm / hour. 45% of the patients had ESR 20- 50 mm/hour. 9% of the patients had ESR greater than 50 mm/hour.

Among 16 patients of ileo-caecal tuberculosis, 6 of them had marked elevation of ESR and one carcinoma caecum associated with ileo-caecal tuberculosis had high ESR.

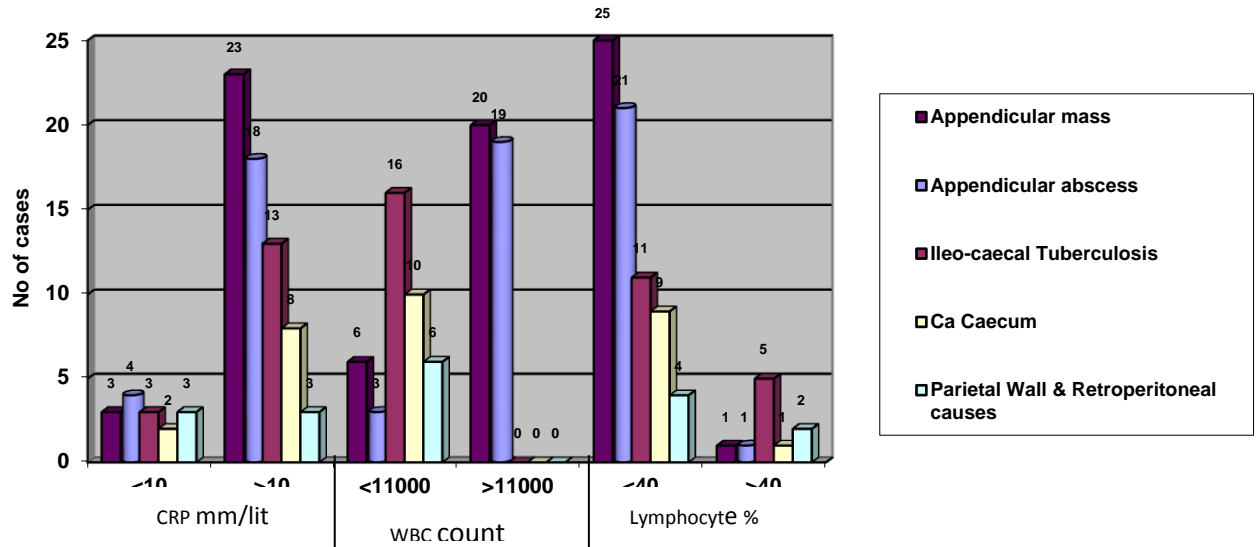
**TABLE 17: CRP & TOTAL LEUCOCYTE COUNT & LYMPHOCYTE PERCENTAGE**

Sl · N o.	Diagnosis	Num ber of cases	CRP mg/ltr				Total Count				Lymphocyte Percentage			
			<1 0	%	>1 0	%	<11 K	%	>11 K	%	<4 0	%	>4 0	%
1	Appendic ular mass	26	3	12	23	88	6	23	20	77	25	96	1	4
2	Appendic ular abscess	22	4	18	18	82	3	14	19	86	21	95	1	5
3	Ileocaecal tuberculos is	16	3	19	13	81	16	100	0	0	11	69	5	31
4	Ca Caecum	10	2	20	8	80	10	100	0	0	9	90	1	10
5	Parietal Wall & Retroperit oneal causes*	6	3	50	3	50	6	100	0	0	4	67	2	33
	Total	<b>80</b>	15	19	65	81	41	51	39	49	70	87.5	10	12.5

\* Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour,

Rectus sheath haematoma

## CRP & TOTAL LEUCOCYTE COUNT & LYMPHOCYTE PERCENTAGE



In our study 85% of the appendicular pathology patients had high CRP levels.

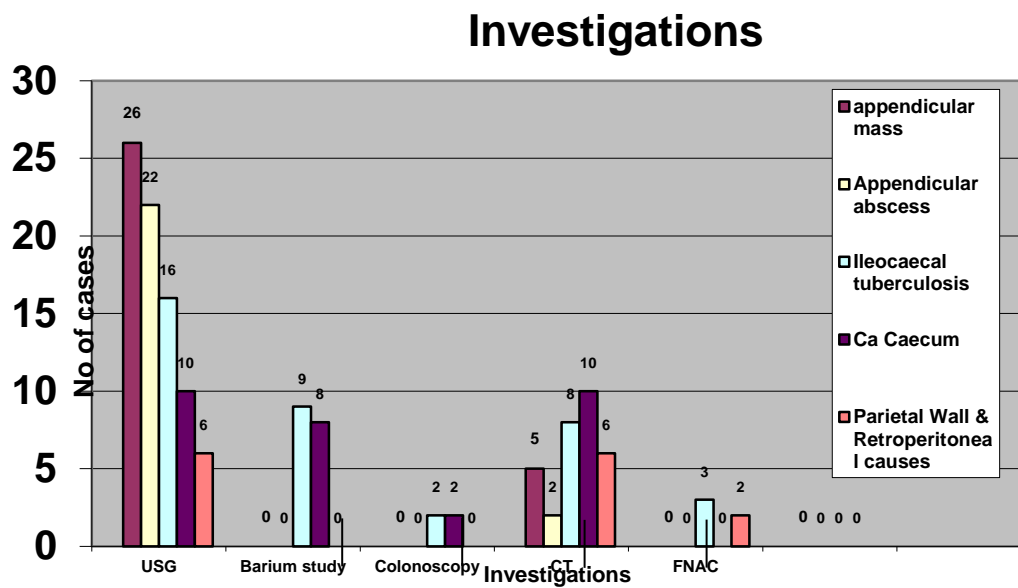
81% of appendicular pathology patients had leukocytosis(  $>11,000$  cells/mm<sup>3</sup>).

41% of tuberculosis associated patients had lymphocytosis.



**TABLE 18: INVESTIGATIONS**

USG (abd & pel)		Barium study		Colonoscopy		CT (abd & pel)		FNAC (USG/CT guided)		Findings
No	%	No	%	No	%	No	%	No	%	
26	32.5	0	0	0	0	5	16	0	0	Appendicular mass
22	27.5	0	0	0	0	2	7	0	0	Appendicular abscess
16	20	9	52	2	50	8	26	3	60	Ileocaecal tuberculosis
10	12.5	8	48	2	50	10	32	0	0	Ca Caecum
6	7.5	0	0	0	0	6	19	2	40	Parietal Wall & Retroperitoneal causes
80	1000	17	100	4	100	31	100	5	100	Total



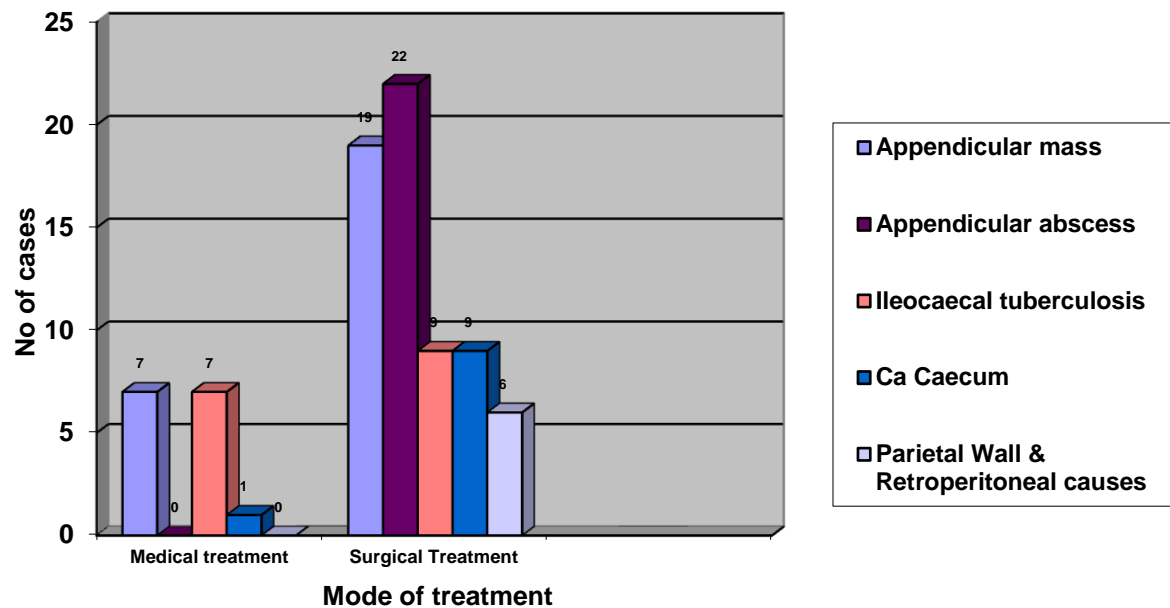
In our study, USG abdomen & pelvis was done for all patients and most of them were diagnosed correctly. Barium study done for (9) ileo-caecal tuberculosis patients and carcinoma caecum (8) patients and all of them were diagnosed correctly. Colonoscopy done for two ileo-caecal tuberculosis and two carcinoma caecum patients. USG/CT guided FNAC done for three ileo-caecal tuberculosis patients and FNAC done for two desmoid tumour patients. CT done for 31 patients in various conditions and all of them were correctly diagnosed.

**TABLE 19: MODE OF TREATMENT**

<b>Sl. No.</b>	<b>Diagnosis</b>	<b>Number of cases</b>	<b>Medical treatment</b>		<b>Surgical Treatment</b>	
			<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>
1	Appendicular mass	26	7	27	19	73
2	Appendicular abscess	22	0	0	22	100
3	Ileocaecal tuberculosis	16	7	44	9	56
4	Ca Caecum	10	1	10	9	90
5	Parietal Wall & Retroperitoneal causes*	6	0	0	6	100
	<b>Total</b>	80	15	19	65	81

\* Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma.

## MODE OF TREATMENT

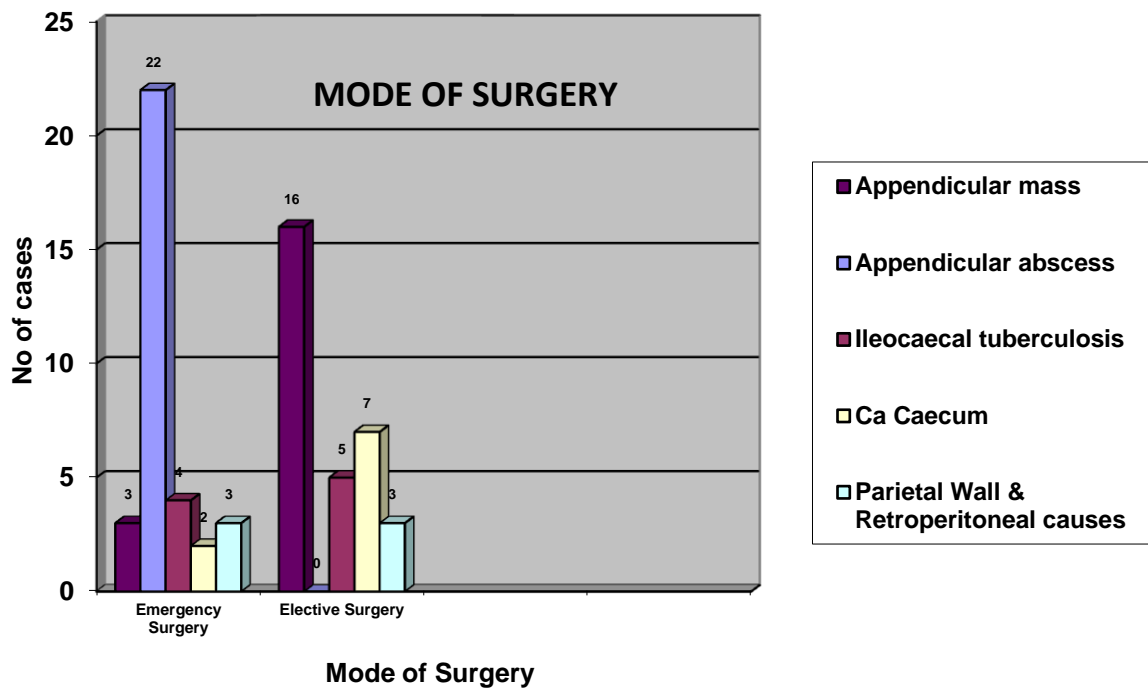


In our study 81% of patients are treated surgically. 19% of patients are treated conservatively. Conservatively treated seven appendicular mass patients did not come for interval appendicectomy. Seven ileo-caecal tuberculosis patients treated conservatively and one advanced carcinoma caecum patient was treated with palliative chemotherapy.

**TABLE 20: MODE OF SURGERY**

Sl. No.	Diagnosis	Number of cases	Emergency Surgery		Elective Surgery	
			No	%	No	%
1	Appendicular mass	19	3	16	16	84
2	Appendicular abscess	22	22	100	0	0
3	Ileocaecal tuberculosis	9	4	44	5	56
4	Ca Caecum	9	2	22	7	78
5	Parietal Wall & Retroperitoneal causes *	6	3	50	3	50
	<b>Total</b>	65	34	52	31	48

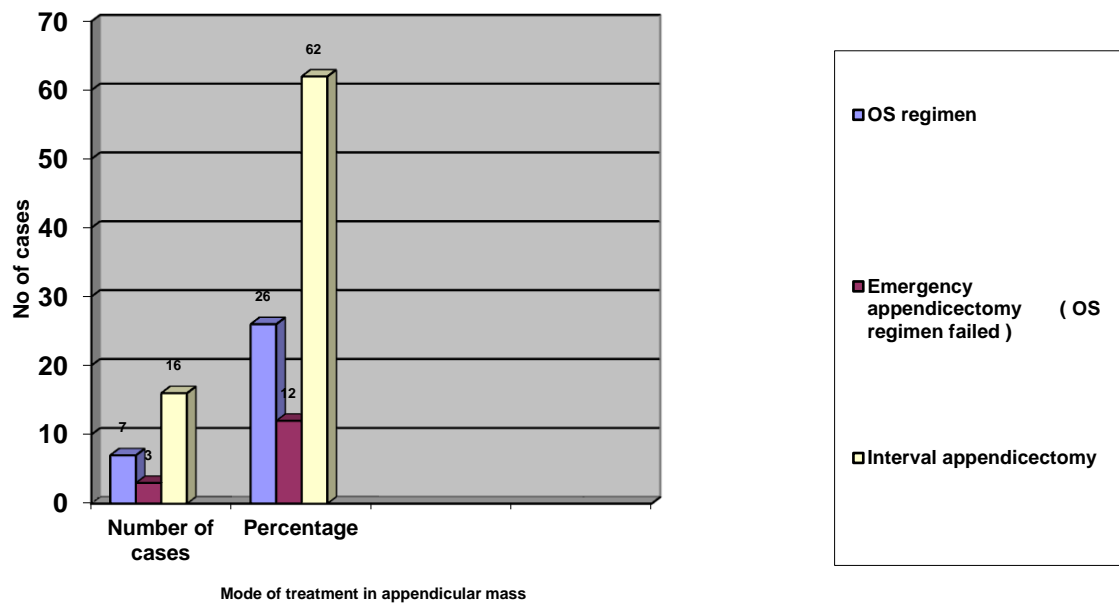
\* Psoas abscess, Retroperitoneal Schwannoma, Desmoid tumour, Rectus sheath haematoma



Among surgically treated 19 appendicular mass patients , 16 patients were treated with interval appendicectomy and 3 patients were treated with emergency appendicectomy. In 22 appendicular abscess patients ,14 patients were treated with emergency appendicectomy and 7 patients were treated with interval appendicectomy following extraperitoneal abscess drainage , one patient was treated by extraperitoneal drainage alone. Among , surgically treated 9 patients of ileo-caecal tuberculosis, 4 patients were treated by emergency procedures following acute presentation and 5 patients were treated by elective procedures after initiating ATT. Among surgically treated 9 carcinoma caecum patients , 7 were treated with elective procedures and 2 patients were treated by emergency procedures for acute presentation.

**TABLE 21: MODE OF TREATMENT FOR APPENDICULAR MASS**

Sl. No.	Mode of treatment	Number of cases	Percentage
1	O-S regimen alone	7	26
2	Emergency appendicectomy ( O-S regimen failed )	3	12
3	Interval appendicectomy (Followed by O-S regimen)	16	62
	<b>Total</b>	26	100



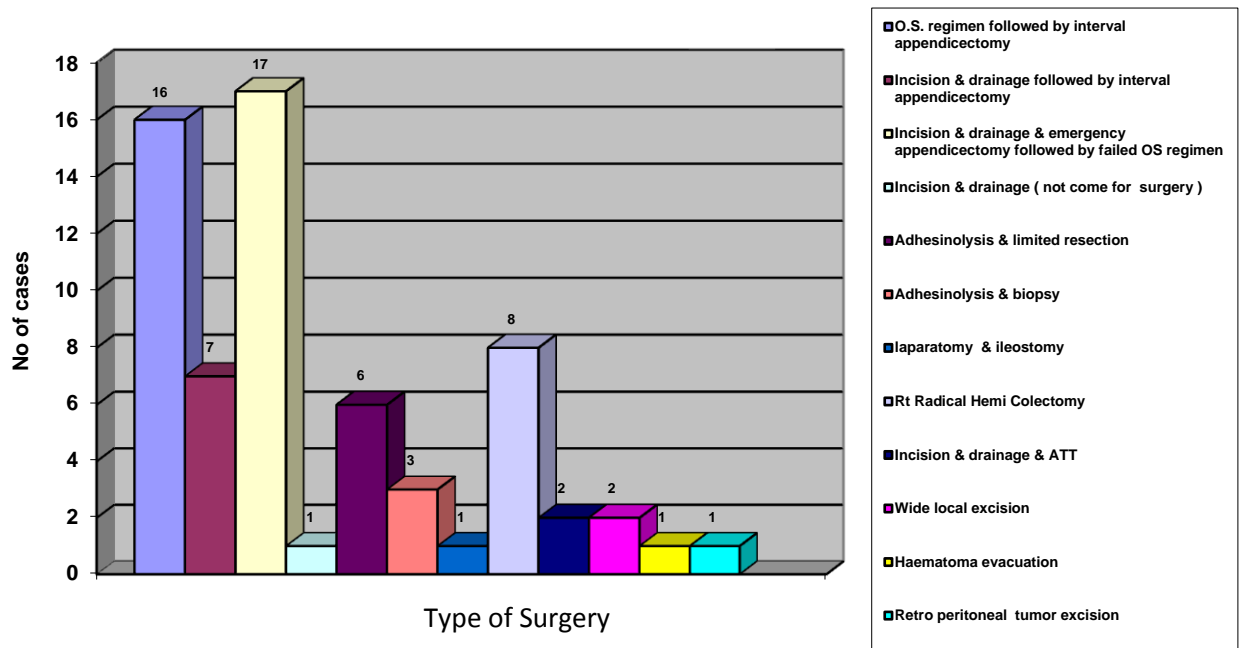
Among conservatively treated 26 appendicular mass patients, 23 patients responded to Ocshner-Sherren's regimen (88%) . 12 % of the patients did not respond to Ocshner-Sherren's regimen were taken for emergency surgery.

**TABLE 22: VARIOUS TYPE OF SURGERY**

<b>Sl.No.</b>	<b>Type of surgery</b>	<b>No of cases</b>	<b>Percentage</b>
1.	O.S. regimen followed by interval appendicectomy	16	25
2.	Incision & drainage followed by interval appendicectomy	7	11
3.	Incision & drainage with emergency appendicectomy and emergency appendicectomy followed by failed OS regimen	17	27
4.	Incision & drainage ( not come for surgery )	1	1.5
5.	Adhesiolysis & limited resection	6	9
6.	Adhesiolysis & biopsy	3	4.5
7.	Laparotomy & ileostomy	1	1.5
8.	Right radical hemicolectomy	8	12
10.	Incision & drainage & ATT	2	3
11.	Wide local excision	2	3
12.	Haematoma evacuation	1	1.5
13.	Retro peritoneal tumor excision	1	1.5
	<b>Total</b>	<b>65</b>	<b>100</b>



## VARIOUS TYPES OF SURGERY



Among surgically treated 19 patients with appendicular mass, 3 cases were emergency appendicectomy, 16 cases were interval appendicectomy.

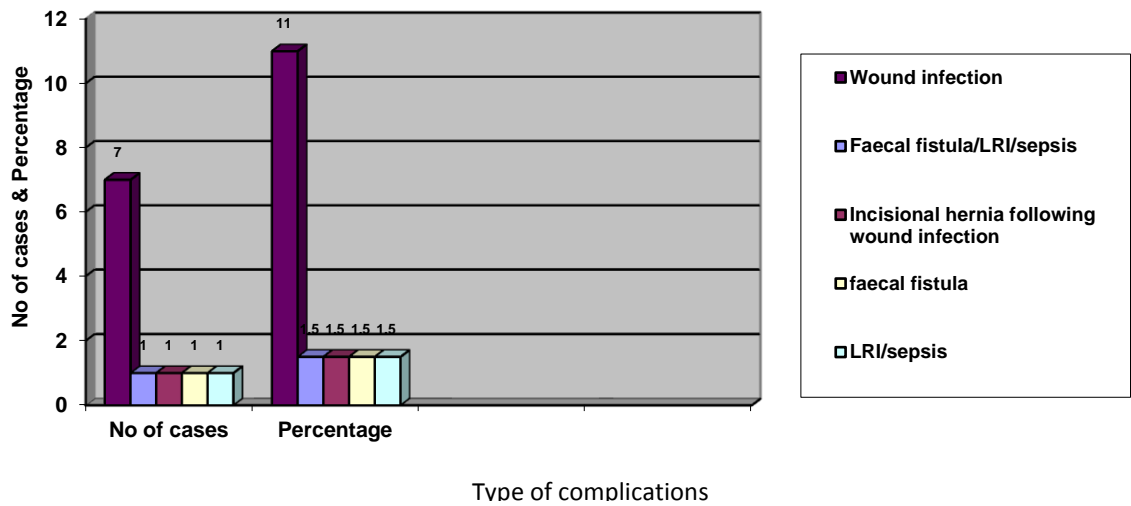
Among 22 patients with appendicular abscess, 14 patients were treated with laparotomy & drainage with emergency appendicectomy and 7 patients treated with laparotomy and drainage followed interval appendicectomy and one patient treated with laparotomy and drainage did not turned back for interval appendicectomy. Among surgically treated 9 ileo-caecal tuberculosis patients, 3 patients are treated with laparotomy and adhesiolysis with biopsy, another 5 patients are treated with laparotomy and adhesiolysis with limited resection, one ileal perforation patient was treated with emergency

laparotomy and limited resection. Among surgically treated 9 carcinoma caecum patients, 7 patients are treated with right radical hemicolectomy electively and emergency right radical hemicolectomy was done for one patient who presented with acute right colo-colic intussusception , another one perforated patient was treated with emergency laparotomy and ileostomy. Laparotomy and excision biopsy was done for retroperitoneal Schwannoma patient. Wide excision and parietal wall reconstruction was done for parietal wall desmoid tumour patients. Psoas abscess patients were treated with extraperitoneal drainage and ATT. Rectus sheath haematoma patient was treated by evacuation.

**TABLE 23: POST OPERATIVE COMPLICATIONS**

<b>Post of complication</b>	<b>No of cases</b>	<b>Percentage</b>
Wound infection	7	11
Faecal fistula/LRI/sepsis	1	1.5
Incisional hernia following wound infection	1	1.5
Faecal fistula	1	1.5
LRI/ sepsis	1	1.5
<b>Total</b>	<b>11</b>	<b>17</b>

## Various complications



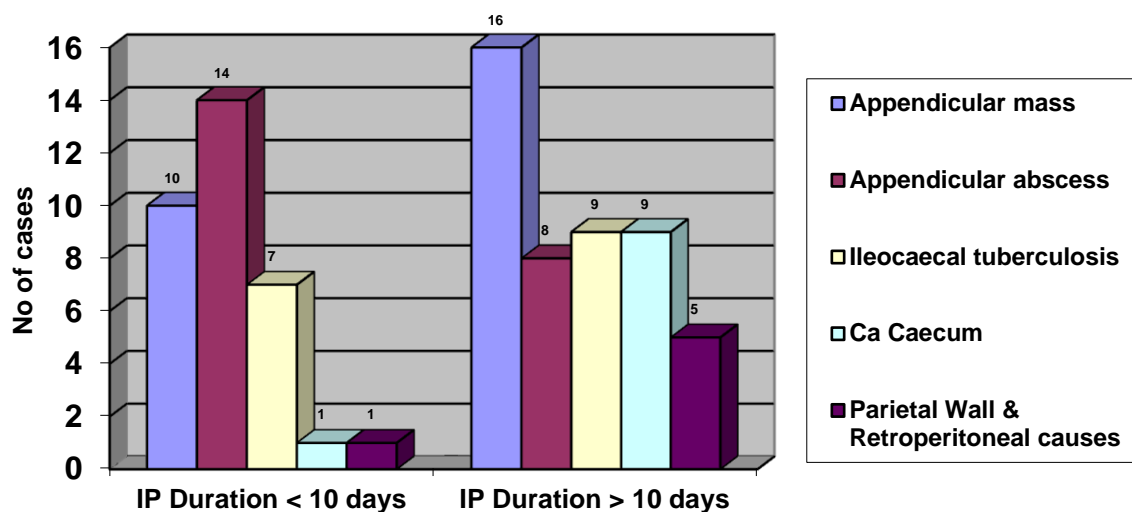
Commonest post-operative complication is wound infection, commonly associated with emergency appendicectomy in either appendicular mass or abscess. One case of faecal fistula is associated with appendicular abscess; another case is associated with ileo-caecal tuberculosis. One case of incisional hernia followed an emergency appendicular abscess drainage procedure.

**TABLE 24: DURATION OF INPATIENT PERIOD (DAYS)**

Sl. No.	Diagnosis	No of cases	IP Duration < 10 days	Percentage	IP Duration > 10 days	Percentage
1	Appendicular mass	26	10	38	16	62
2	Appendicular abscess	22	14	64	8	36
3	Ileocaecal tuberculosis	16	7	44	9	56
4	Ca Caecum	10	1	10	9	90
5	Parietal Wall & Retroperitoneal causes	6	1	17	5	83
<b>Total</b>		80	33	41	47	59

In our study 41% of patients had in-patient stay of less than 10 days. 59% of patients stayed for more than 10 days, these included surgically treated ileo-caecal tuberculosis and carcinoma caecum cases. Most of the interval appendicectomy patient's hospitalization is more than 10 days.

## Duration of Hospitalisation



In our study 95 % of post-operative patients are on regular follow up. Surgically treated 8 and conservatively treated 7 ileo-caecal tuberculosis patients, abdominal tuberculosis associated one carcinoma caecum patient and 2 psoas abscess patients are on regular follow-up with ATT (DOTS-I). One ileo-caecal tuberculosis , one carcinoma caecum patient expired in post-operative period out of surgically treated 65 patients.

## **DISCUSSION**

Mass in the right iliac fossa is one of the common entity in surgical practice. Evaluation of right iliac fossa mass is essential for management and outcome. In our study of “Evaluation of Right Iliac Fossa Mass” was made at our institution Chengalpattu Medical College from October 2010 to October 2012. 80 cases of right iliac fossa mass were studied. Among 80 cases, majority of the cases are from rural, low socio-economic group. In our study the commonest cause of right iliac mass is appendicular pathology (either appendicular mass -32.5% or appendicular abscess - 27.5%) followed by ileo-caecal tuberculosis- 20% and carcinoma caecum-12.5% other rare causes - 7.5%.

## **APPENDICULAR PATHOLOGY**

In our study, appendicular pathology (either appendicular mass or appendicular abscess) constituted 60%. According to Schwartz’s principles of surgery, male to female ratio in appendicular pathology is 1.2 - 1.3 : 1 , in our study male to female ratio is 1.1: 1 , which is comparable .

In our study of appendicular pathology 100% of patients had pain and 69% had fever, 40% had vomiting and anorexia, 88% had tachycardia and common age group is 10 – 60 years (98%<sup>36</sup>). Okafor PI et al said common symptoms in appendicular mass and appendicular abscess are pain, fever,

dyspepsia, anorexia and tender palpable RIF mass and the commonest age group is 2<sup>nd</sup> to 6<sup>th</sup> decade, which is comparable in our study .

Majority of patients had symptoms for less than one month duration and only a few patients had abdominal mass as a symptom, and most of appendicular pathology patients are not anaemic, had mild elevation of ESR, and raised heart rate in 88% of cases. Oliak<sup>37</sup> D et al said factors at admission, pain, fever, tachycardia like symptoms and blood investigations had 86% sensitivity and 58% specificity, which is comparable.

In our study 85% of patients had elevated C-Reactive protein and 81% had leukocytosis. Gronross<sup>38</sup> JN et al said leukocytosis is an early marker in appendicular pathology and raised CRP is a late marker and if leucocyte count and CRP are normal that condition is unrelated to appendicular mass or abscess, which is comparable. Gronross JM<sup>39</sup> said that appendicular mass or abscess can be ruled out in an adult patient if total leucocyte count and CRP are within normal limits .

In our study, 88% of appendicular mass patients responded to Ocshner-sherren's regimen. Among 26 appendicular mass patients , 3 patients (12%) failed conservative management and were taken up for emergency appendicectomy. All conservatively treated patients are advised interval

appendicectomy, 62% patients (16) underwent interval appendicectomy and 26% of patients(7) did not come back for interval appendicectomy.

Erdogan D<sup>40</sup> et al said Ocshner-sherren regimen for appendicular mass is safe and interval appendicectomy is advisable, which favors our study.

In our study, among 22 appendicular abscess patients, emergency extraperitoneal abscess drainage was done for all, along with drainage 14 patients (64%) underwent emergency appendicectomy and 7 patients (32%) underwent interval appendicectomy after 3 months , and 1 patient (4%) did not come back for interval appendicectomy . Zarba<sup>41</sup> et al said emergency appendicectomy with abscess drainage is the mode of treatment for appendicular abscess with low morbidity and minimal hospitalization and minimal health cost and post-operative morbidity only 9% . Out of 9% ,wound infection is 75% and wound dehiscence is 25% which is comparable.

Among 48 appendicular pathology patients 7 patients were treated conservatively , 1 patient treated with abscess drainage only, 23 patients treated with interval appendicectomy and 17 patients treated with emergency appendicectomy . Among 17 patients treated with emergency appendicectomy 6 patients developed wound infection, 1 patient developed faecal fistula, among those 6 patients who developed wound infection , 1 patient developed incisional hernia . All emergency appendicectomy patients



HPE report was acute appendicitis and for all interval appendicectomy patients HPE report was chronic appendicitis. Most of the post-operative complications occurred in emergency appendicectomy done for appendicular mass or appendicular abscess. Interval appendicectomy planned for either conservatively treated appendicular mass patients or post appendicular abscess drainage patients increases duration of hospital stay and cost of health, but interval appendicectomy produced very minimal post-operative complications. Hurme T<sup>42</sup> et al said emergency appendicectomy done for appendicular abscess in acute phase produced more complications, abscess drainage followed by interval appendicectomy healed well without complications, which is comparable. Eriksson S<sup>43</sup> et al said that interval appendicectomy and emergency appendicectomy for acute appendicitis had the same complication rates.

Lasson A<sup>44</sup> et al said that percutaneous aspiration followed by interval appendicectomy for appendicular abscess is the best treatment. Recurrent appendicitis is common if abscess drainage done without interval appendicectomy. Post-operative complications are least in interval appendicectomy, which is comparable.

Conservatively treated appendicular mass patients and appendicular abscess patients treated by surgical drainage without appendicectomy are

prone for recurrent appendicitis (20%) when compared to general population (15%) with no significant difference, so interval appendicectomy is controversial.

Hoffman<sup>45</sup> et al said only 20% of patients developed recurrence following conservative treatment of appendicular mass. Among 20%, most of the recurrence (66%) occurred within 2 years. Corefield L et al<sup>46</sup> said more than 50% of the surgeons do interval appendicectomy anticipating the recurrence rate of 10% - 25% and complication rate of 23%. So a randomized control trial is needed for evaluation of this issue.

In our institution, conservatively treated 16 appendicular mass patients and surgically drained 7 appendicular abscess patients underwent interval appendicectomy (74%). Conservatively treated 26% patients did not come for follow-up and surgery.

## **ILEO-CAECAL TUBERCULOSIS**

Abdominal tuberculosis is one of the important gastroenterological problem in developing countries, newer drugs and advanced socio-economic status in developed countries controlled the tuberculosis, but majority of the under developed countries had huge problem in prevention of tuberculosis, abdominal tuberculosis is a common problem in our country also. Majority of the abdominal tuberculosis patients treated conservatively in our institution.

Ileo-caecal tuberculosis constituted about 30% of abdominal tuberculosis .

Commonly affected age group is 25 – 50 years, common symptoms are pain , fever, vomiting , weight loss and anorexia . In our institution 20% of RIF mass are due to ileo-caecal tuberculosis, 56% are females and 44% are males.

Most of patients had symptoms for more than one month, 56 % of patients had symptoms for 1 -3 months. Commonest symptoms are pain, followed by fever and loss of weight. Majority of the patients had firm, mobile or restricted mobile, irregular mass per abdomen.

62.5% of patients are anaemic, more than 75% of patients had elevated ESR.

Sharp J E<sup>47</sup> et al said 95% of the patients had elevated ESR , which is comparable in our study.

In our study , among 80 patients, 20% (16 patients ) had ileo-caecal tuberculosis. Among 16 patients (19%), 3 patients had positive Mantoux test, and 2 patients (13%) had Koch's lesion on chest radiography and 8 patients (50%) had air-fluid level , one patient had pneumoperitoneum on abdomen radiography.

80% of ileo-caecal tuberculosis had elevated CRP. CRP titres are used to assess the treatment response of the disease. 30% of the patients had lymphocytosis and 44% of the patients were treated conservatively .

USG is an initial investigation for the diagnosis of ileo-caecal tuberculosis. In inconclusive cases CT, barium study, colonoscopy with biopsy, USG/CT guided FNAC like other mode of investigations were done. Laparoscopy is the useful recent modality for diagnostic and therapeutic purposes in abdominal tuberculosis. Balthazar E J<sup>48</sup> et al said barium study with CT conjunction is useful for the diagnosis of the location, extent and mesenteric involvement of ileo-caecal tuberculosis lesions .

Uzun Koy<sup>49</sup> – A et al said USG guided FNAC is a reliable investigation for ileo-caecal tuberculosis, which is comparable .

Rai S<sup>50</sup> et al said that common complaints are pain and weight loss, clinical features are non-specific, and consistent laboratory findings are elevated CRP and low Hb% in more than 90% of the patients and Mantoux test was positive in 22%, which is comparable .

Immanuvel<sup>51</sup> C et al said decreasing serum C – Reactive Protein titres in ileo-caecal tuberculosis is an useful indicator for treatment response. 62% of the patients had elevated serum CRP initially, after completion of ATT only 14% of the patients had raised CRP levels , which is comparable .

Among 16 patients, 7 (44%) were treated with ATT alone. 9 patients (56%) underwent surgery. Among 9 patients, 4 (44%) underwent emergency surgery before initiating ATT and 5 patients (56%) underwent surgery after

initiating ATT. Adhesiolysis, limited resection and anastomosis, right hemicolectomy and ileostomy like various procedures done for appropriate cases in our institution. All patients HPE report was ileo-caecal tuberculosis. More than 50% of the patient's hospital stay is greater than 10 days, 2 patients suffered from wound infection. Ileostomy with right hemicolectomy done ileal perforated patient expired with wound infection, LRI and sepsis. Most of the patients came for regular follow-up and are on ATT (DOTS-I).

Kosal' enikov<sup>52</sup> S O et al said surgery is required for 91% of complicated abdominal tuberculosis patients. Commonly, right hemicolectomy, enterostomy, abscess drainage, excision of necrotic lymph nodes, adhesiolysis, formation of bowel by-pass or anastomosis are required in appropriate patients. Early diagnosis with ATT and surgical procedures improved the outcome, which is comparable.

Prakash A<sup>53</sup> et al said ileo-caecal tuberculosis is common in 20 – 40 years of age and affected female to male ratio is 1.6:1. Barium study is a useful investigation. 44% of patients developed sub-acute intestinal obstruction and 16% patients had acute intestinal obstruction. Bowel resection and by-pass procedures are required in 16% of patients, which is comparable.

Muneef M A<sup>54</sup> et al said that incidence of ileo-caecal tuberculosis is 52 % in females and 48% in males and mean age is 46 years. Commonest clinical

symptoms are fever , pain abdomen , weight loss, in 70% of the patients , mass per abdomen in 67% , altered bowel habits in 39% of the patients and anorexia in 30% of the patients . Clinical signs are fever in 73% of the patients , ascites in 61% of the patients, mass abdomen 13% of the patients and doughy abdomen in 9% of the patients. Mantoux test is positive in 27% of patients , CT abdomen showed ascites, peritoneal lesions and enlarged nodes in 80% of the patients .

Biopsy taken in 61% of the patients, HPE reported positive in 97% of the patients. Significant percentage of the patients recovered with medical management alone , which is comparable .

### **CARCINOMA CAECUM**

Colorectal carcinoma commonly occurs after 5<sup>th</sup> decade, males are more prone than females and high prevalence rate is noted in high socio-economical group of population. In our study of RIF mass, 12.5% cases are due to carcinoma caecum and majority of the patients are in 6<sup>th</sup> decade followed by 7<sup>th</sup> and 5<sup>th</sup> decade, male to female ratio is 3:2, most of the patients are from low socio-economical group.

Stock – C <sup>55</sup> et al said carcinoma caecum is more prevalent in patients more than 50 years of age, affects males more than females . Colonic carcinoma prevalence is increased in 8<sup>th</sup> decade , which is comparable .

Mohandas <sup>56</sup>K M et al said male sex is predominantly affected in colonic carcinoma and increased prevalence is noted in immigrants and urban population than rural Indians due to environmental and dietary habits , which is comparable .

Majority of patients had symptoms for more than 1 month, commonest symptoms are pain , loss of weight and mass per abdomen. All cases had hard mobile or fixed RIF mass . 80% of carcinoma caecum patients were anaemic and had mild elevation of ESR . Among 10 cases of carcinoma caecum marked elevation of ESR is present in one case that had associated abdominal tuberculosis (10%).

Li J N<sup>57</sup> et al said that carcinoma colon is a disease of the old age associated with anaemia and palpable mass per abdomen, right sided colonic malignancies decreased and left sided colonic malignancies are increased in current studies .

Sadahiro<sup>58</sup> S et al said 26% of women and 21% of men with right sided colonic carcinoma have haemoglobin less than 10 grams percentage, which is comparable.

Forslund<sup>59</sup> A et al said that low haemoglobin and elevated ESR , CEA, ALP is present in colonic carcinoma . Outcome of the patients with marked elevation of ESR and severe anaemia was poor, which is comparable .

In our study, 20% of patients had significant elevation of serum CRP titres.

Gur T<sup>60</sup> et al said colonic malignancy patients had significant elevation of CRP and Chung Y C<sup>61</sup> et al said outcome of the patients with elevated serum CRP was poor and one-third of the patients with advanced disease had markedly elevated CRP titres , which is comparable.

USG abdomen and pelvis was done for all patients (100%),barium study was done for 8 patients , CT scan abdomen and pelvis was done for all patients . CT scan revealed RIF mass in 8 patients , right sided colo-colic intussusception in one patient and pneumoperitoneum in another one patient. Colonoscopy was done for 20% of the patients .

Storm E<sup>62</sup> et al said that barium study has 91% sensitivity for diagnosis of colonic malignancies , which is comparable.

In our study, 90% of the patients are treated surgically in our institution . Among 10 patients , majority of the patients(7) were treated by right radical hemicolectomy (70%) electively and one patient (10%) with right colo-colic intussusception underwent emergency right radical hemicolectomy with primary anastomosis . Another one patient with ileal perforation, underwent emergency ileostomy and expired post-operatively due to LRI with septicemia. All other patients came for regular follow-up and were on anti-cancer chemotherapy. One patient (10%) with advanced carcinoma caecum



was treated with palliative chemotherapy. For all post-operative patients HPE reports revealed various types of adenocarcinoma caecum. Among 10 carcinoma caecum patients, one patient (10%) had associated abdominal tuberculosis and was started on ATT prior to chemotherapy.

Herfath<sup>63</sup> C et al said that treatment of carcinoma caecum and ascending colon presenting with obstruction, the treatment of choice was right hemicolectomy with ileostomy and transverse colostomy, which is comparable in our study .

### **PARIETAL WALL AND RETROPERITONEAL CAUSES**

In our study, both the parietal wall desmoid tumour patients are females in reproductive age group .USG, CT confirmed the parietal wall lesion, FNAC and excision biopsy followed by surgery confirmed the diagnosis.

Aissa<sup>64</sup> A et al said that desmoid tumour is common in anterior abdominal wall, more prevalent in pregnancy and post-partum period and associated with hormonal influence . USG , CT , MRI and post-operative excisional biopsy reports are confirmatory investigations , which is comparable .

Etiology of both the psoas abscess patients was tuberculosis, both underwent extra-peritoneal drainage with ATT.

Villar F<sup>65</sup> C et al said 50% of the psoas abscess is associated with skeletal tuberculosis, which is comparable in our study.

In our study, one rectus sheath haematoma patient presented as RIF mass , surgical evacuation of the haematoma was done as the conservative management failed .

Rajagopal <sup>66</sup>et al said that abdominal pain in parietal wall haematoma is a rare entity and is treated conservatively and rarely require surgical intervention, which is comparable.

In our study, one retroperitoneal Schwannoma patient presented as RIF mass which was diagnosed by USG/CT/ USG guided core needle biopsy. Surgical excision was done .

Rai B R <sup>67</sup>et al said that pelvic Schwannoma presented as RIF mass and right sciatica, which is comparable .

In our study USG abdomen and pelvis is done for all cases and RIF mass was diagnosed in more than 95% of the patients . In inconclusive cases, various investigations like CT, barium study, colonoscopy, USG guided FNAC were done .

According to the Sabiston text book of surgery USG abdomen had 85% sensitivity and 90% specificity for diagnosis of appendicular pathology, which is comparable . Millard F C<sup>68</sup> et al said USG abdomen correctly diagnosed 97% of RIF masses , so the investigation of choice in RIF mass is USG abdomen, which is comparable .

Jain R<sup>69</sup> et al said that sonographic features of abdominal tuberculosis thickened mesentery and lymphadenopathy, dilated small bowel loops and ascites were diagnosed in 98% of the patients , which is comparable .

Martinez<sup>70</sup> Ares D et al said that USG abdomen is 79% sensitive and 92% specific for the diagnosis of colonic carcinoma , which is comparable .

In our study, overall post-operative morbidity is 17 % and mortality is 3% . Common post-operative complication is wound infection . Most of the post-operative complications are treated conservatively.

## CONCLUSION

- Right iliac fossa mass was common in 20 to 50 years of age group.
- Overall incidence was more common in males as compared to females (1.1:1). Appendicular pathology and Carcinoma caecum was more common in males as compared to females. Ileo-caecal tuberculosis was more common in females.
- The diseases were more in people from low socio –economic status and the commonest symptom was pain in abdomen.
- Appendicular pathology (60%) either in the form of appendicular mass (32.5%) or appendicular abscess (27.5%) were the commonest cause of mass in the right iliac fossa. Ileo-caecal tuberculosis (20%), carcinoma caecum (12.5%) was the other common causes of mass in the right iliac fossa.
- Ultrasound abdomen was the essential investigation and it had a sensitivity of greater than 95%.
- Normal levels of serum CRP titer essentially ruled out appendicular pathology. Serial titers were helpful in assessing the treatment response of ileo-caecal tuberculosis and in prognosis of carcinoma caecum.

- ⊕ In patients with appendicular mass, initial conservative management followed by interval appendicectomy had better results with minimal complications.
- ⊕ In patients with appendicular abscess, abscess drainage combined with appendicectomy in the same procedure, had high morbidity compared to patients who underwent interval appendicectomy following abscess drainage.
- ⊕ 44% of the patients with ileo-caecal tuberculosis were managed conservatively with anti-tubercular therapy (DOTS-I). Surgery was required in another 56 % of the patients, of which 25 % of the patients presented with acute complications needing immediate surgery. 31 % of the patients presented with sub-acute intestinal obstruction due to adhesions and strictures following the initiation of anti-tubercular therapy, which later required surgical intervention.
- ⊕ 80 % of the patients with carcinoma caecum underwent successful surgical resection. 20 % of the patients presented with acute surgical problem requiring immediate surgery. 10 % of the patients presented with advanced disease.

- ⊕ Most of the parietal wall and retroperitoneal conditions were treated surgically.
- ⊕ Early evaluation and intervention is needed to improve the patients' outcome and to reduce the morbidity and mortality.

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## EVALUATION OF RIGHT ILIAC FOSSA MASS

### PROFORMA

Name: IP.NO: DOA:

Age: DOS:

Sex: DOD:

Occupation:

Address:

Presenting complaints:

Duration of presenting complaints:

H/o presenting illness:

Pain: Loss of appetite:

Fever: Loss of weight:

Vomiting: Jaundice:

Others:

Past history:

Family history:

Personal history:

Diet:

Alcohol/Smoking:

Socioeconomical status:

General examination:

Built and nourishment:

Hydration:

Fever:

Anaemia:

Pedal oedema:

Jaundice:

Generalised lymph nodes:

Pulse:

BP:

Systemic examination

CVS:

RS:

CNS:

ABDOMEN:

Inspection:

Shape

Movement with respiration

Umbilicus

Skin/scar/dilated veins

Hernial orifices/genitalia

Loins/supraclavicular node

Palpation:

Soft/doughy/Warmth

Guarding/rigidity

Tenderness

Swelling

Site and plane of swelling

Size

Extension

Consistency

Shape

Borders

Mobility

Pulsation

Get all around the swelling

Free fluids Abdomen:

Left supraclavicular node

Examination of Back:

Spine:

Renal angle:

Percussion:

Auscultation:

PR:

PV:

Provisional diagnosis:

## Investigations

Blood investigations:

Hb:

TC:

DC: P: L: E: B: M:

ESR: B. Urea: S. Creat.:

Mantoux test: CRP: PT:

Sputum for AFB: HIV: HbsAg:

LFT:

TP: Alb: Glob:

TB: Direct: Indirect:

SGOT: SGPT: ALP:

Urine: Alb: Sugar: Deposits:

Stool:

Gross:

Microscopy:



Ova/cyst:

Occult blood:

CXR:

Plain X-ray abdomen:

Barium study:

Follow through:

Enema:

FNAC:

USG abdomen:

CT abdomen:

USG guided FNAC:

Colonoscopy:

Biopsy:

Ascitic fluid for analysis:

Macroscopic:

Microscopic:

Staining: Z-N:

Gram:

Biochemical:

Treatment:

Conservative:

Surgical: Mode of surgery: Emg:

Elec:

Procedure done:

Postoperative period:

Complications:

Duration of hospital stay:

HPE:

Follow up:

Remarks:

## CONSENT FORM

I \_\_\_\_\_ IP.NO \_\_\_\_\_ in my full senses  
hereby give my complete consent for  
\_\_\_\_\_

Or any procedures deemed fit which is a /and diagnostic procedure / biopsy /  
transfusion/medication / operation to be performed on me / my daughter/ my  
ward \_\_\_\_\_ age \_\_\_\_\_ under any anaesthesia  
deemed fit. The nature and risk involved in the procedure have been explained  
to me, to my satisfaction. For academic and scientific purpose, the operation /  
procedure may be televised or photographed.

Place: Signature/Thumb impression

Date: of the patient/ guardian

Guardian

Relationship :

Address :

## **DECLARATION**

I, **Dr. S. SANKAR**, solemnly declare that the dissertation  
**“EVALUATION OF RIGHT ILIAC FOSSA MASS - A  
RETROSPECTIVE STUDY”** a bonafide work done by me in the  
Department of General Surgery, Chengalpattu Medical College, Chengalpattu,  
Under the able guidance of **Prof. Dr. G. Raja Billy Graham M.S**, Professor  
& Head, Department of General Surgery , Chengalpattu Medical College ,  
Chengalpattu .

Place: Chengalpattu.

**(Dr. S. SANKAR)**

Date:

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## **LIST OF ABBREVIATIONS**

ADA	- Adenosine deaminase
ALP	- Alkaline phosphatase
ATT	- Antitubercular treatment
Ca	- Carcinoma
CEA	- Carcinoembryonic antigen
CT	- Computerized Tomography.
CRP	- C - reactive protein
DVT	- Deep vein thrombosis
EGFR	- Epidermal growth factor receptor
FNAC	- Fine needle aspiration cytology
5-FU	- 5-Fluro uracil
HIV	- Human immunodeficiency virus
HPE	- Histopathological examination
LIF	- Left iliac fossa
LRI	- Lower respiratory tract infection
MRI	- Magnetic resonance imaging
NSAID	- Non steroidal anti-inflammatory drugs.



O-S - Ochsner- Sherren regimen

PCR - Polymerase chain reaction

PET - Positron emission tomography

PPD - Purified protein derivatives

RIF - Right iliac fossa

Tc99 - Technetium 99

TC - Total leucocyte count

TNF - Tumor necrosis factor

USG - Ultrasonogram

VEGF - Vascular endothelial growth factor

WBC - White blood cell

Yrs - Years

**Mucocoele of the appendix.**



**Acute Appendicitis**



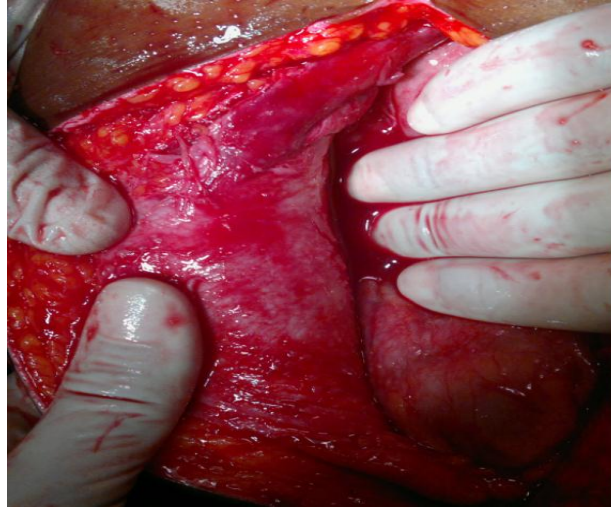
**Right iliac fossa mass**



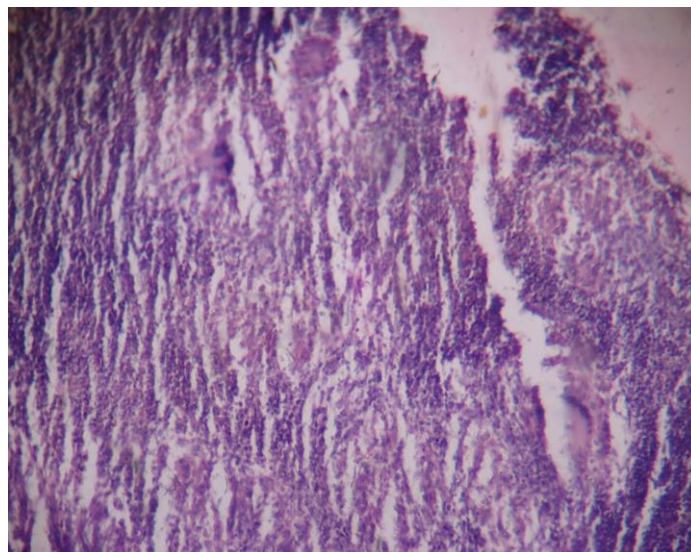
**CT scan of abdomen showing Desmoid tumor.**



## Abdominal tuberculosis



Histopathological picture of ileo caecal tuberculosis.





**Faecal fistula following appendicular abscess drainage.**



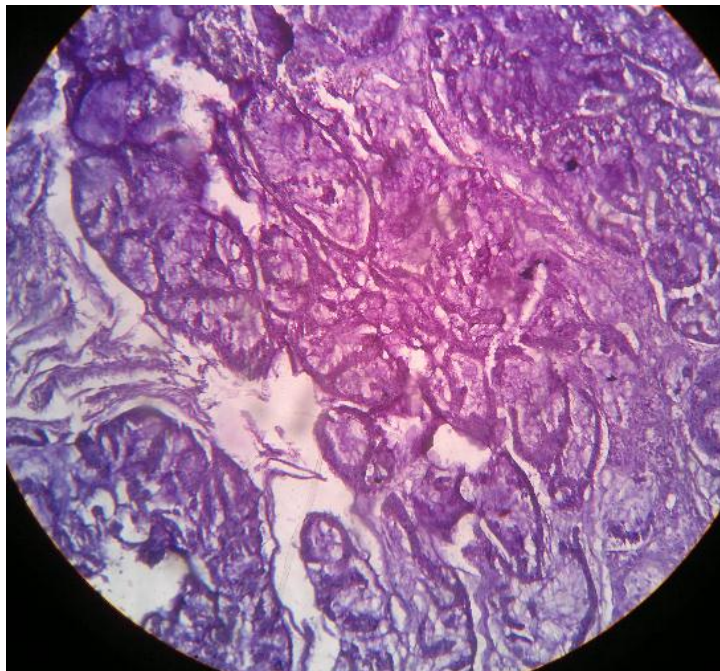
**Incisional hernia in Appendicectomy scar.**



**Gross specimen of carcinoma caecum.**

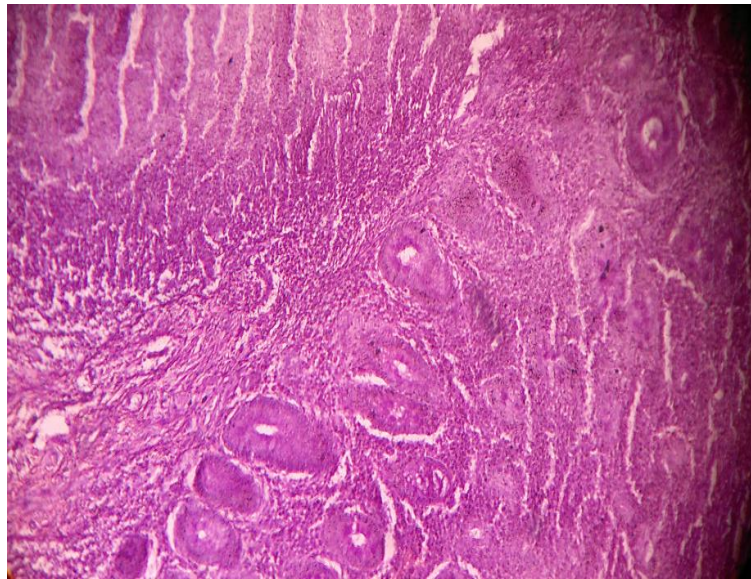


**Histopathological picture of Carcinoma Caecum.**

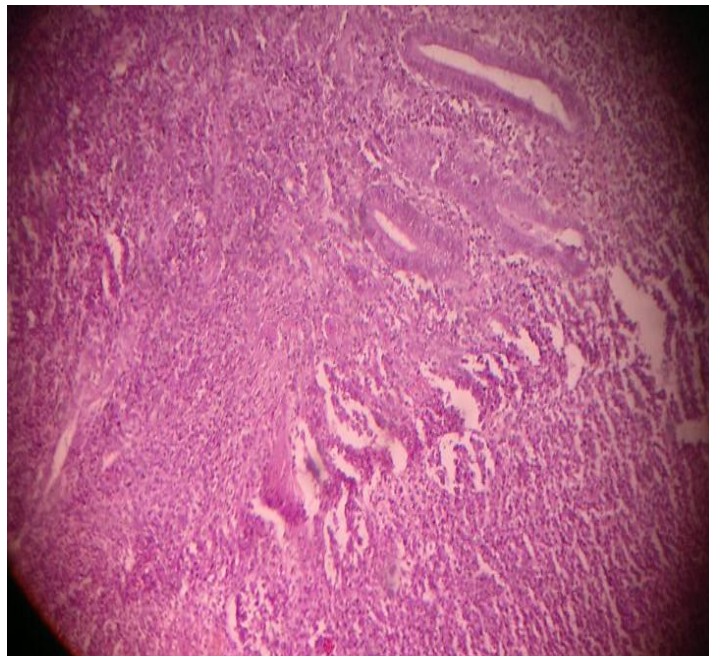




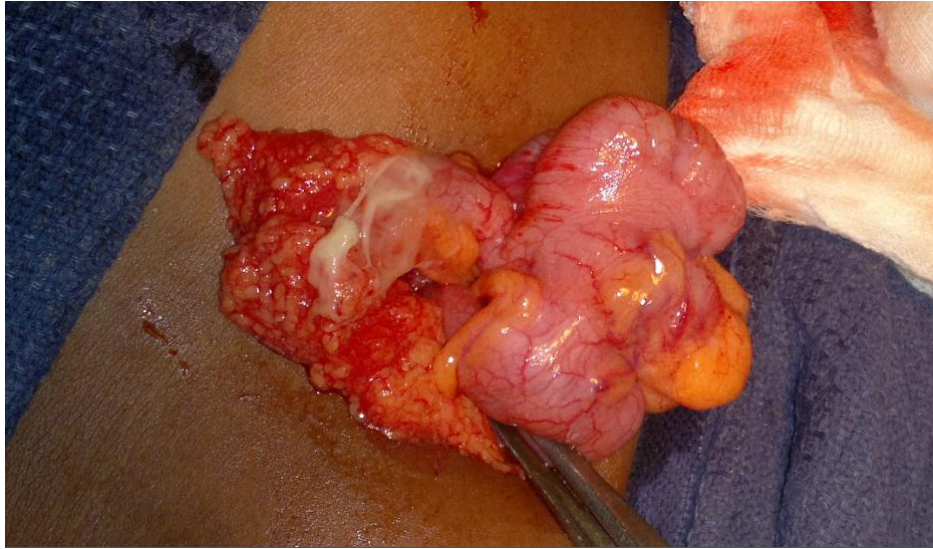
**Histopathological picture of Chronic appendicitis.**



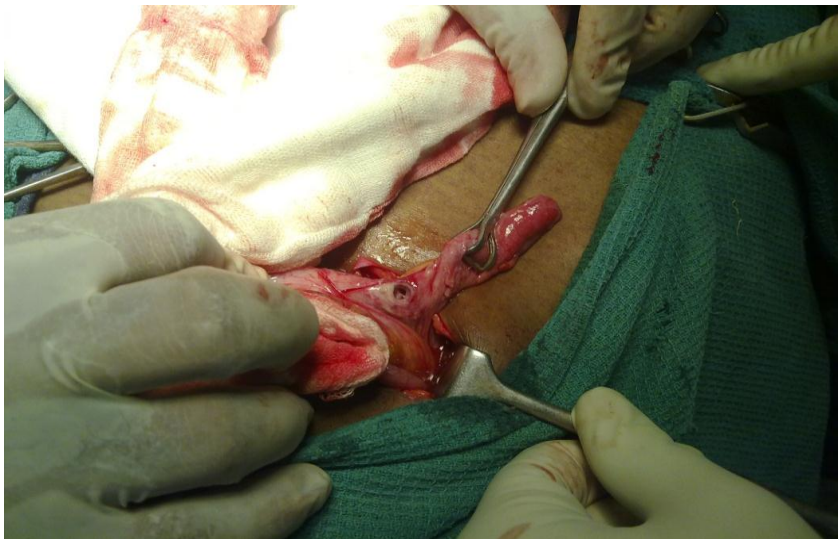
**Histopathological picture of Acute appendicitis.**



**Early appendicular mass**

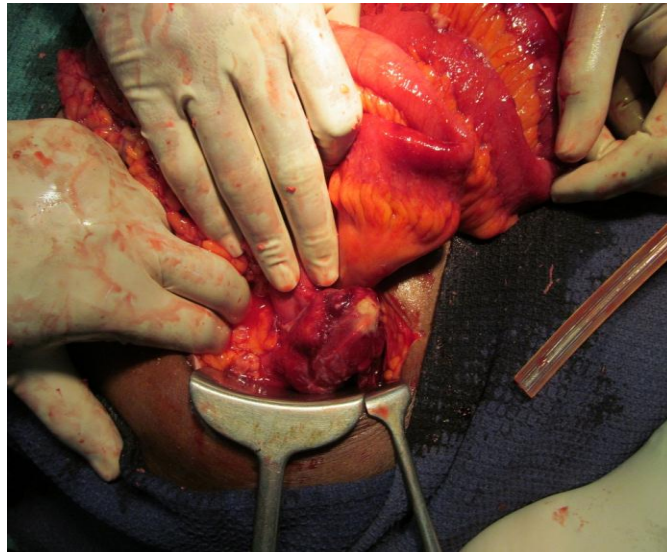


**Appendicular abscess with perforated appendix.**

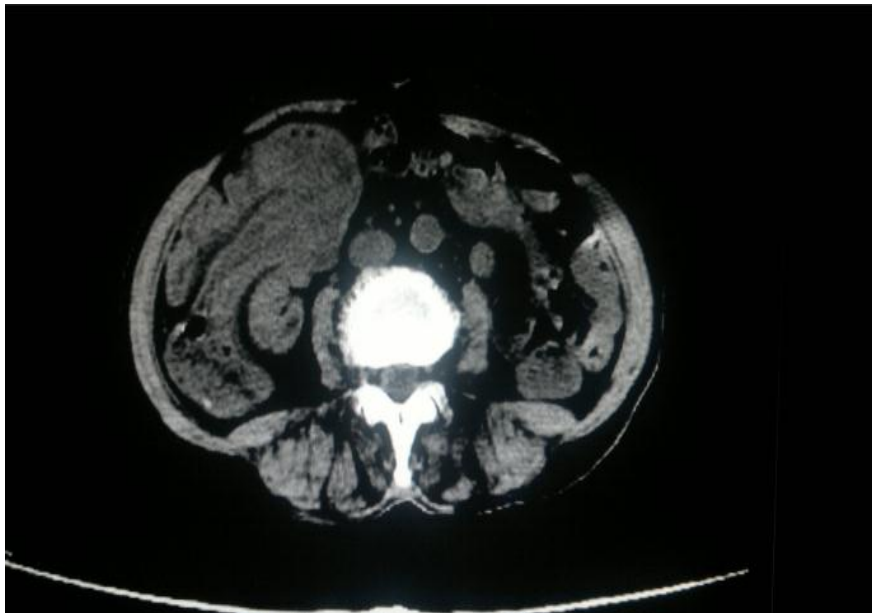




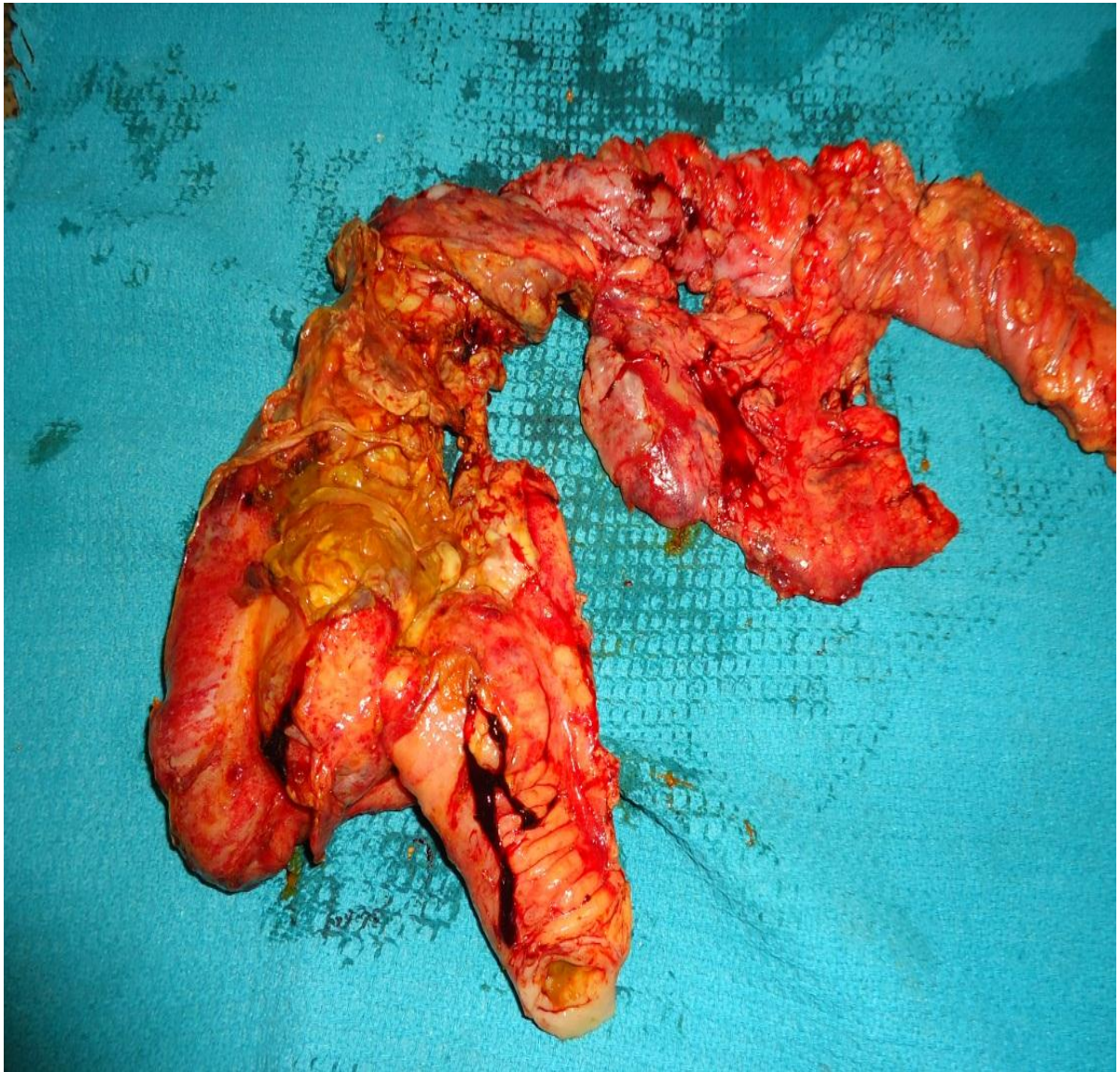
## Appendicular mass



## CT scan abdomen showing intussusception in the right iliac fossa



**Right hemicolectomy specimen of ileo-caecal tuberculosis.**



## MASTER CHART

SI NO	NAME	AGE	SEX	IP NO	OCCUPATION	PAIN	FEVER	WADSEA /VOMITI NG	LOSS WT APP	MASS	DURATION	MASS	TENDERNESS	SIZE	SURFACE	BORDER	CONSISTENCY	MOBILITY	PULSE	HB	TC	LYMPHOCYTE
1	AVAMMAL	21	f	40989	s	y	y	y			7	y	y	7 x 7	smooth	regular	firm	fixed	98	12.2	12.7	32
2	CHAMUNDESWARI	33	f	41529	hw	y	y	y		y	19	y	y	7 x 7	smooth	regular	firm	fixed	84	10.9	12.7	27
3	KRISHNAMOORTHY	40	m	44120	c	y					11	y	y	7 x 5	smooth	regular	firm	fixed	120	12.2	17	35
4	JAYALAKSHMI	33	f	252	c	y	y	y			7	y	y	8 x 8	smooth	diffuse	soft	fixed	94	9.8	11.2	23
5	MUTHULAKSHMI	19	f	1182	s	y	y				7	y	y	6 x 5	smooth	diffuse	soft	fixed	95	11.2	22.3	27
6	DINESH	22	m	1850	c	y	y	y			10	y	y	6 x 6	smooth	regular	firm	fixed	92	9.4	10.8	27
7	MANIVANNAN	31	m	3848	c	y			y		150	y		7 x 5	smooth	irregular	firm	yes	108	10.7	9.7	40
8	BHOOPATHI	25	m	4786	teacher	y	y				7	y	y	8 x 5	smooth	regular	firm	fixed	96	9.6	15	35
9	RAJESHWARI	35	f	4611	c	y	y				5	y	y	7 x 5	smooth	diffuse	soft	fixed	90	11	7.8	28
10	PALANIVEL	25	m	7186	c	y		y			9	y	y	8 x 4	smooth	diffuse	soft	fixed	98	12.4	13.5	24
11	KAVITHA	30	f	7847	hw	y				y	11	y	y	8 x 6	smooth	diffuse	soft	fixed	84	10.8	11.2	32
12	MADHAVAN	45	m	8299	c	y	y	y			13	y	y	7 x 7	smooth	diffuse	soft	fixed	88	12.2	25.2	21
13	PARVEEN	42	f	12226	c	y			y	y	240	y		6 x 5	smooth	irregular	hard	fixed	88	7.4	6.2	24
14	RAMESH	25	m	12975	b	y	y				4	y	y	7 x 5	smooth	diffuse	soft	fixed	112	13	9.2	32
15	MOHAMMED ASHRAF	34	m	14629	c	y	y				6	y	y	7 x 5	smooth	regular	firm	fixed	92	11.2	13.2	32
16	DANAPAL	58	m	15112	c	y			y	y	50	y		6 x 5	nodular	irregular	hard	restricted	86	9.4	8.2	38
17	DEIVAMANI	27	f	18204	c	y				y	75	y	y	5 x 5	nodular	irregular	firm	restricted	78	9.2	6.9	25
18	SHAKTHIVEL	17	m	19818	s	y	y				6	y	y	7 x 7	smooth	diffuse	soft	fixed	94	12.7	14.2	20
19	BABY	64	f	20810	c	y		y			3	y	y	8 x 5	smooth	regular	firm	fixed	112	10.7	14.2	25
20	MUNUSWAMY	58	m	22432	c	y	y	y	y	y	120	y	y	8 x 5	smooth	irregular	hard	fixed	108	8.8	6.7	34
21	MUTHULAKSHMI	65	m	24276	c	y			y	y	45	y		7 x 3	smooth	irregular	hard	restricted	92	8.2	8.2	32
22	CHINNAIPAIIAN	70	m	24623	c	y			y	y	135	y		8 x 6	smooth	irregular	hard	restricted	78	8.6	9.4	28
23	DAYALAN	30	m	25438	c	y	y	y		y	80	y	y	6 x 6	nodular	irregular	firm	restricted	84	11.4	10.3	29
24	MANIKANTHAN	14	m	25560	s	y	y			y	24	y	y	6 x 8	smooth	diffuse	soft	fixed	84	9.4	6.2	54
25	VASANTHA	60	f	26096	c	y		y	y	y	165	y		7 x 5	nodular	irregular	hard	restricted	72	7.8	7.2	36
26	PRIYA	28	f	40141	teacher	y	y				7	y	y	8 x 8	smooth	diffuse	soft	fixed	94	9.2	12.4	27
26	SOLOMON BABU	48	m	27436	c	y	y			y	3	y	y	7 x 5	smooth	diffuse	soft	fixed	82	10.1	9.4	28
27	SATYA	18	m	30755	s	y	y				11	y	y	7 x 4	smooth	regular	firm	fixed	90	12	14.2	46
28	SELVAM	45	m	31259	c	y		y	y		24	y	y	8 x 8	smooth	irregular	hard	restricted	78	11.2	6.2	28
29	JEEVANANDAM	35	m	31705	b	y		y			9	y	y	8 x 5	smooth	diffuse	soft	fixed	92	11.4	11.8	28
30	INDRANI	50	f	32400	c	y	y				60	y	y	8 x 8	nodular	irregular	firm	restricted	92	9.2	9.2	35

31	KUPPAN	60	m	32657	c	y			y	y	60	y		8 x 4	nodular	irregular	hard	restricted	82	9.2	7.5	32
32	MUNIYAMMAL	22	f	33575	hw	y				y	60	y		7 x 7	smooth	regular	firm	restricted	88	10.2	7	30
33	KANCHANA	15	f	34278	s	y	y				10	y	y	8 x 6	smooth	regular	firm	fixed	96	8.8	12.7	37
34	SELVI	35	f	36053	c	y			y		25	y		10 x 5	smooth	irregular	firm	yes	84	8.4	9.2	32
35	DANUSH	49	m	38016	c	y	y	y	y		60	y	y	8 x 8	nodular	irregular	firm	restricted	82	8.9	5.9	30
37	PARVATHAM	60	f	40446	hw	y		y	y		30	y	y	5 x 5	smooth	irregular	hard	restricted	80	9.8	6.6	26
38	KUMAR	30	m	41541	c	y	y	y	y		60	y	y	7 x 5	smooth	irregular	firm	restricted	120	10.2	7.2	44
39	KANALMOZHI	20	f	42558	s	y					7	y	y	5 x 5	smooth	regular	firm	fixed	98	11.8	13.2	32
40	MENAKA	25	f	44274	c	y	y				5	y	y	7 x 5	smooth	diffuse	soft	fixed	98	11.3	14.5	21
41	PARVATHAM	50	f	44446	c	y	y	y	y	y	60	y		7 x 7	smooth	irregular	firm	yes	88	8.6	8.8	37
42	ANANDAN	28	m	46668	b	y					11	y	y	8 x 8	smooth	regular	firm	fixed	92	12.2	8.8	27
43	OMSAKTHI	27	m	46932	c	y	y	y			14	y	y	7 x 7	smooth	regular	firm	fixed	98	11.2	20.5	32
44	RANJITHAM	35	f	47480	c	y	y	y			7	y	y	5 x 5	smooth	diffuse	soft	fixed	92	11.4	15.2	44
45	RAJAKUMARI	42	f	2418	c	y				y	70	y		8 x 7	nodular	regular	hard	restricted	76	10.4	9.2	30
46	VENKATAMMAL	24	f	2714	c	y	y	y			5	y	y	3 x 3	smooth	regular	firm	fixed	102	11.4	12.2	30
47	SATYA	27	f	2938	hw	y	y				4	y	y	6 x 5	smooth	diffuse	soft	fixed	104	11	12.2	20
48	PARTHASARATHY	60	m	4850	c	y					9	y	y	8 x 5	smooth	diffuse	soft	fixed	94	12.2	13.1	29
49	MASTHAN	52	m	9417	c	y	y	y			3	y	y	7 x 5	smooth	diffuse	soft	fixed	118	9.9	11.9	32
50	SUBRAMANI	20	m	10026	s	y					6	y	y	7 x 7	smooth	regular	firm	fixed	90	11	13	36
51	GUNASEKARAN	28	m	13575	c	y		y			28	y		8 x 5	smooth	irregular	firm	yes	80	9.4	6.7	45
52	DIVYA	21	f	13894	s	y	y				6	y	y	6 x 5	smooth	diffuse	soft	fixed	94	11.8	11.3	22
53	GOPALAKRISHNAN	25	m	14120	c	y					5	y	y	8 x 7	smooth	regular	firm	fixed	92	12.4	7.5	38
54	PRIYA	21	f	14819	s	y	y	y			8	y	y	7 x 7	smooth	diffuse	soft	fixed	90	10.2	14.3	21
55	PONNAMAL	45	f	15792	c	y	y				3	y	y	8 x 6	smooth	regular	firm	fixed	118	10.7	13.5	24
56	SATYAN	13	m	15903	s	y	y	y			5	y	y	8 x 8	smooth	regular	firm	fixed	90	12.7	13.2	29
57	PONNAMAL	45	f	16793	c	y		y	y	y	240	y		7 x 7	smooth	irregular	firm	yes	86	7.8	6.8	42
58	ARUL	32	f	16892	teacher	y					22	y		8 x 8	nodular	irregular	firm	yes	90	11	6.5	27
59	KAMALA	45	f	17411	hw	y		y			4	y	y	8 x 4	smooth	regular	firm	fixed	94	10.2	12.5	29
60	SHANTHI	26	f	17695	hw	y	y				9	y	y	6 x 6	smooth	regular	firm	fixed	94	11	10.5	32
61	KUPPU	40	m	17951	c	y	y				3	y	y	8 x 5	smooth	diffuse	soft	fixed	96	12.4	8.6	34
62	ARUNDATHI	27	f	19599	c	y	y				11	y	y	7 x 7	smooth	regular	firm	fixed	88	12.2	13.2	34
63	SETTU	22	m	20579	c	y	y				6	y	y	8 x 8	smooth	diffuse	soft	fixed	92	12.2	17.2	20
64	DASRATHAM	50	m	21590	c	y	y		y	y	55	y	y	6 x 6	smooth	diffuse	soft	fixed	78	9	7.4	42
65	YASODA	35	f	23198	c	y				y	20	y	y	8 x 5	smooth	regular	firm	fixed	78	12.7	13.8	27
66	KANNAGI	25	f	23435	c	y	y			y	110	y	y	7 x 5	nodular	irregular	firm	restricted	90	10.7	10.2	28
67	ARUNA	28	f	23724	c	y	y	y	y		45	y	y	10 x 7	smooth	irregular	firm	restricted	78	9.2	7	34
68	DEVI	18	f	26061	s	y	y		y		50	y		8 x 5	nodular	irregular	firm	yes	88	7.8	8.7	34
69	SUJATHA	32	f	27308	hw	y	y				28	y	y	7 x 7	nodular	irregular	hard	restricted	78	10.4	8.2	46
70	KARTHIK	20	m	32137	s	y	y		y		70	y	y	7 x 7	nodular	irregular	firm	restricted	88	7.7	9.2	43
71	GOVINDAMMAL	40	f	33501	b	y	y	y			3	y	y	7 x 7	smooth	regular	firm	fixed	98	11.8	10.5	37
72	CHINNARAJU	15	m	35778	s	y	y	y			6	y	y	7 x 5	smooth	diffuse	soft	fixed	94	11.2	21	29

73	INDRANI	37	f	36788	c	y		y			8	y	y	10 x 6	smooth	regular	firm	fixed	86	11.4	13.7	30
74	VEERASWAMY	60	m	37230	c	y	y		y	y	300	y	y	8 x 7	smooth	irregular	firm	restricted	94	10.2	8.6	41
75	SHANMUGAM	35	m	37912	teacher	y				y	11	y	y	6 x 6	smooth	diffuse	soft	fixed	78	12.8	22.9	27
76	SUBRAMANI	30	m	38624	b	y	y				9	y	y	7 x 7	smooth	regular	firm	fixed	98	11.6	14	35
77	ESTHER	47	f	39692	hw	y				y	31	y		12 x 10	smooth	regular	hard	restricted	80	11.2	6.8	32
78	JAYARAMAN	29	m	39694	c	y	y	y			7	y	y	7 x 5	smooth	regular	firm	fixed	96	9.7	9.9	29
79	SEENU	23	m	39718	c	y					9	y	y	6 x 5	smooth	regular	firm	fixed	90	11.8	13.9	26
80	DAISY	38	f	40122	hw	y	y	y			6	y	y	5 x 5	smooth	diffuse	soft	fixed	98	9	11.6	29

## MASTER CHART (CONTINUED)

SI NO.	NAME	IP NO	ESR	CRP	MANTOUX	CXR	ABD X RAY	USG	CT	FNAC	BARIUM STUDY	COLONOSCOPY	DIAGNOSIS	TREATMENT	SURGERY	PROCEDURE	POST OP PERIOD	IP DURATION	HPE	FOLLOWUP	REMARK
1	AVAMMAL	40989	22	17	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
2	CHAMUNDESWARI	41529	41	8	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
3	KRISHNAMOORTHY	44120	15	21	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	9	-	NCF	NC S
4	JAYALAKSHMI	252	15	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
5	MUTHULAKSHMI	1182	12	37	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	wound inf	12	CA	-	-
6	DINESH	1850	24	15	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NC S
7	MANIVANNAN	3848	46	9	y	koch s	MAF L	ICT	ND	ND	ND	ND	ICT	S	EM	ADL bx	-	14	ICT	ATT	-
8	BHOOPATHI	4786	17	8	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	6	-	NCF	NC S
9	RAJESHWARI	4611	22	9	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-

10	PALANIVEL	7186	32	12	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
11	KAVITHA	7847	17	47	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	13	CA	-	-
12	MADHAVAN	8299	31	22	N	N	N	App abs	app abs	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
13	PARVEEN	12226	34	12	N	METS	N	CA METS	CA CAECU M	ND	IFD	ND	CA CAECU M	C	-	-	-	9	-	CC	-
14	RAMESH	12975	22	8	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	12	AA	-	-
15	MOHAMMED ASHRAF	14629	22	22	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
16	DANAPAL	15112	19	14	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	17	MD AD	CC	-
17	DEIVAMANI	18204	44	8	N	N	N	ICT	BW T	ND	ND	ND	ICT	C	-	-	-	9	-	ATT	-
18	SHAKTHIVEL	19818	30	14	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
19	BABY	20810	15	20	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EM	Appendicec tomy	uneventful	7	AA	-	-
20	MUNUSWAMY	22432	32	24	N	AUD	AUD	CA CAECU M FF	CA CAECU M AUD	ND	ND	ND	CA CAECU M WITH PERF	S	EM	RHC ILEOS	SEP LRI	6	MU AD	EXP IRE D	EX PI RE D
21	MUTHULAKSHMI	24276	17	17	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	17	MD AD	CC	-
22	CHINNAPAIYAN	24623	30	15	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	15	MD AD	CC	-
23	DAYALAN	25438	40	24	N	N	MAF L	ICT	BW T	ICT	PUC	ND	ICT	S	EL	ADL LR	fecal fistula LRI	24	ICT	EXP IRE D	EX PI RE D
24	MANIKANTHAN	25560	42	14	N	N	N	PS ABS	PS ABS	ND	ND	ND	PS ABS	S	EM	I & D	-	12	-	ATT	GI BB US
25	VASANTHA	26096	18	7	N	N	N	CA CAECU M	CC INT PT	ND	ND	ND	CA CAECU M	S	EM	RRHC	-	17	MD AD	CC	-

26	PRIYA	40141	27	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	13	CA	-	-
26	SOLOMON BABU	27436	12	12	N	N	N	PAR CL	PAR CL	ND	ND	ND	PAR HEM	S	EM	EVACTN	-	5	-	-	-
27	SATYA	30755	12	14	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	5	-	NCF	NC S
28	SELVAM	31259	19	12	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	CA CAE CU M	CA CAECU M	S	EL	RRHC	-	15	MD AD	CC	-
29	JEEVANANDAM	31705	16	19	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	14	CA	-	-
30	INDRANI	32400	74	30	N	N	N	ICT	BW T	ND	PUC	ND	ICT	C	-	-	-	8	-	ATT	-
31	KUPPAN	32657	18	8	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	20	MD AD	CC	-
32	MUNIYAMMAL	33575	8	8	N	N	N	RP SW	RP SW	ND	ND	ND	RP MASS	S	EL	EX BIPSY	-	14	SCW NM A	-	-
33	KANCHANA	34278	20	27	N	N	N	App mass	App mass	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NC S
34	SELVI	36053	64	15	N	N	MAF L	ICT	BW T	ND	PUC	ND	ICT	S	EL	ADL LR	-	17	ICT	ATT	-
35	DANUSH	38016	20	13	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	11	-	ATT	-
37	PARVATHAM	40446	14	22	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	13	MD AD	CC	-
38	KUMAR	41541	19	22	y	N	MAF L	ICT	BW T	ND	PUC	ND	ICT	S	EL	ADL LR	-	15	ICT	ATT	-
39	KANALMOZHI	42558	13	42	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	12	CA	-	-
40	MENAKA	44274	11	25	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
41	PARVATHAM	44446	58	13	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	7	-	ATT	-
42	ANANDAN	46668	27	14	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
43	OMSAKTHI	46932	26	24	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	16	CA	-	-
44	RANJITHAM	47480	35	27	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	7	AA	-	-
45	RAJAKUMARI	2418	14	6	N	N	N	PAR SW	PAR SW	DES TU M	ND	ND	DES TUM	S	EL	WLE	-	12	DES TU M	-	-



46	VENKATAMMAL	2714	18	21	N	N	N	App mass	ND	ND	ND	ND	App mass with ovarian cyst	S	EM	Appendicec tomy	uneventful	7	AA	-	-
47	SATYA	2938	30	7	N	N	app lith	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	9	AA	-	-
48	PARTHASARATHY	4850	42	21	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID	fecal fistula	14	-	NCF	NC S
49	MASTHAN	9417	30	18	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	9	AA	-	-
50	SUBRAMANI	10026	32	42	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NC S
51	GUNASEKARAN	13575	62	9	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	9	-	ATT	-
52	DIVYA	13894	12	49	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	8	AA	-	-
53	GOPALAKRISHNAN	14120	27	53	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
54	PRIYA	14819	26	34	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	wound inf	15	CA	-	-
55	PONNAMAL	15792	22	41	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EM	Appendicec tomy	wound inf	8	AA	-	-
56	SATYAN	15903	22	24	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
57	PONNAMAL	16793	18	16	N	N	MAF L	ICT	BW T	ND	ND	ND	ICT	S	EM	ADL bx	-	16	ICT	ATT	-
58	ARUL	16892	58	12	N	N	MAF L	ICT	ND	ICT	PUC	ND	ICT	S	EL	ADL LR	-	15	ICT	ATT	-
59	KAMALA	17411	20	27	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
60	SHANTHI	17695	15	9	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
61	KUPPU	17951	22	9	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	14	AA	-	-
62	ARUNDATHI	19599	17	27	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
63	SETTU	20579	18	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	9	CA	-	-
64	DASRATHAM	21590	38	11	N	N	N	PS ABS	PS ABS	ND	ND	ND	PS ABS	S	EM	I & D	-	10	-	ATT	-
65	YASODA	23198	47	44	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
66	KANNAGI	23435	39	22	N	AUD	AUD	ICT	ND	ND	ND	ND	ILEAL PERF ICT	S	EM	LR ILEOS	wound inf	28	ICT	ATT	-
67	ARUNA	23724	88	14	N	N	N	ICT	BW T	ND	PUC	ND	ICT	C	-	-	-	7	-	ATT	-

68	DEVI	26061	48	28	N	N	N	ICT	ND	ND	ND	ICT	ICT	C	-	-	-	9	-	ATT	-
69	SUJATHA	27308	56	28	y	N	N	CA CAEC UM	CAC AEC UM	ND	IFD	CA CAE CU M	CA CAECU M WITH KOCHS	S	EL	RRHC	-	14	MU AD	ATT CC	-
70	KARTHIK	32137	19	21	N	N	MAF L	ICT	ND	ND	ND	ND	ICT	S	EM	ADL bx	-	9	ICT	ATT	-
71	GOVINDAMMAL	33501	10	20	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
72	CHINNARAJU	35778	24	13	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
73	INDRANI	36788	13	21	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	6	-	NCF	NC S
74	VEERASWAMY	37230	42	22	y	koch s	MAF L	ICT	BW T	ICT	ND	ND	ICT	S	EL	ADL LR	wound inf	20	ICT	ATT	-
75	SHANMUGAM	37912	34	52	N	N	N	App abs	app abs	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	9	AA	-	-
76	SUBRAMANI	38624	17	20	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
77	ESTHER	39692	10	8	N	N	N	PAR SW	PAR SW	DES TU M	ND	ND	DES TUM	S	EL	WLE	-	10	DES TU M	-	-
78	JAYARAMAN	39694	15	14	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
79	SEENU	39718	24	15	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
80	DAISY	40122	14	16	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	9	CA	-	-

## MASTER CHART (CONTINUED)

SI NO.	NAME	IP NO	ESR	CRP	MANTOUX	CXR	ABD X RAY	USG	CT	FNAC	BARIUM STUDY	COLONOSCOPY	DIAGNOSIS	TREATMENT	SURGERY	PROCEDURE	POST OP PERIOD	IP DURATION	HPE	FOLLOWUP	REMARK
1	AVAMMAL	40989	22	17	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
2	CHAMUNDESWARI	41529	41	8	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
3	KRISHNAMOORTHY	44120	15	21	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	9	-	NCF	NCS
4	JAYALAKSHMI	252	15	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
5	MUTHULAKSHMI	1182	12	37	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	wound inf	12	CA	-	-
6	DINESH	1850	24	15	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NCS
7	MANIVANNAN	3848	46	9	y	kochs	MAFL	ICT	ND	ND	ND	ND	ICT	S	EM	ADL bx	-	14	ICT	ATT	-
8	BHOOPATHI	4786	17	8	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	6	-	NCF	NCS
9	RAJESHWARI	4611	22	9	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-

10	PALANIVEL	7186	32	12	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
11	KAVITHA	7847	17	47	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	13	CA	-	-
12	MADHAVAN	8299	31	22	N	N	N	App abs	app abs	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
13	PARVEEN	12226	34	12	N	METS	N	CA METS	CA CAECU M	ND	IFD	ND	CA CAECU M	C	-	-	-	9	-	CC	-
14	RAMESH	12975	22	8	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	12	AA	-	-
15	MOHAMMED ASHRAF	14629	22	22	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
16	DANAPAL	15112	19	14	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	17	MD AD	CC	-
17	DEIVAMANI	18204	44	8	N	N	N	ICT	BW T	ND	ND	ND	ICT	C	-	-	-	9	-	ATT	-
18	SHAKTHIVEL	19818	30	14	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
19	BABY	20810	15	20	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EM	Appendicec tomy	uneventful	7	AA	-	-
20	MUNUSWAMY	22432	32	24	N	AUD	AUD	CA CAECU M FF	CA CAECU M AUD	ND	ND	ND	CA CAECU M WITH PERF	S	EM	RHC ILEOS	SEP LRI	6	MU AD	EXP IRE D	EX PI RE D
21	MUTHULAKSHMI	24276	17	17	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	17	MD AD	CC	-
22	CHINNAPAIYAN	24623	30	15	N	N	N	CA CAECU M	CA CAECU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	15	MD AD	CC	-
23	DAYALAN	25438	40	24	N	N	MAF L	ICT	BW T	ICT	PUC	ND	ICT	S	EL	ADL LR	fecal fistula LRI	24	ICT	EXP IRE D	EX PI RE D
24	MANIKANTHAN	25560	42	14	N	N	N	PS ABS	PS ABS	ND	ND	ND	PS ABS	S	EM	I & D	-	12	-	ATT	GI BB US
25	VASANTHA	26096	18	7	N	N	N	CA CAECU M	CC INT PT	ND	ND	ND	CA CAECU M	S	EM	RRHC	-	17	MD AD	CC	-

26	PRIYA	40141	27	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	13	CA	-	-
26	SOLOMON BABU	27436	12	12	N	N	N	PAR CL	PAR CL	ND	ND	ND	PAR HEM	S	EM	EVACTN	-	5	-	-	-
27	SATYA	30755	12	14	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	5	-	NCF	NC S
28	SELVAM	31259	19	12	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	CA CAE CU M	CA CAECU M	S	EL	RRHC	-	15	MD AD	CC	-
29	JEEVANANDAM	31705	16	19	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	14	CA	-	-
30	INDRANI	32400	74	30	N	N	N	ICT	BW T	ND	PUC	ND	ICT	C	-	-	-	8	-	ATT	-
31	KUPPAN	32657	18	8	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	20	MD AD	CC	-
32	MUNIYAMMAL	33575	8	8	N	N	N	RP SW	RP SW	ND	ND	ND	RP MASS	S	EL	EX BIPSY	-	14	SCW NM A	-	-
33	KANCHANA	34278	20	27	N	N	N	App mass	App mass	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NC S
34	SELVI	36053	64	15	N	N	MAF L	ICT	BW T	ND	PUC	ND	ICT	S	EL	ADL LR	-	17	ICT	ATT	-
35	DANUSH	38016	20	13	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	11	-	ATT	-
37	PARVATHAM	40446	14	22	N	N	N	CA CAEC UM	CA CAE CU M	ND	IFD	ND	CA CAECU M	S	EL	RRHC	-	13	MD AD	CC	-
38	KUMAR	41541	19	22	y	N	MAF L	ICT	BW T	ND	PUC	ND	ICT	S	EL	ADL LR	-	15	ICT	ATT	-
39	KANALMOZHI	42558	13	42	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	12	CA	-	-
40	MENAKA	44274	11	25	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
41	PARVATHAM	44446	58	13	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	7	-	ATT	-
42	ANANDAN	46668	27	14	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
43	OMSAKTHI	46932	26	24	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	16	CA	-	-
44	RANJITHAM	47480	35	27	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	7	AA	-	-
45	RAJAKUMARI	2418	14	6	N	N	N	PAR SW	PAR SW	DES TU M	ND	ND	DES TUM	S	EL	WLE	-	12	DES TU M	-	-

46	VENKATAMMAL	2714	18	21	N	N	N	App mass	ND	ND	ND	ND	App mass with ovarian cyst	S	EM	Appendicec tomy	uneventful	7	AA	-	-
47	SATYA	2938	30	7	N	N	app lith	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	9	AA	-	-
48	PARTHASARATHY	4850	42	21	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID	fecal fistula	14	-	NCF	NC S
49	MASTHAN	9417	30	18	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	9	AA	-	-
50	SUBRAMANI	10026	32	42	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	7	-	NCF	NC S
51	GUNASEKARAN	13575	62	9	N	N	N	ICT	ND	ND	PUC	ND	ICT	C	-	-	-	9	-	ATT	-
52	DIVYA	13894	12	49	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	8	AA	-	-
53	GOPALAKRISHNAN	14120	27	53	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
54	PRIYA	14819	26	34	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	wound inf	15	CA	-	-
55	PONNAMAL	15792	22	41	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EM	Appendicec tomy	wound inf	8	AA	-	-
56	SATYAN	15903	22	24	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
57	PONNAMAL	16793	18	16	N	N	MAF L	ICT	BW T	ND	ND	ND	ICT	S	EM	ADL bx	-	16	ICT	ATT	-
58	ARUL	16892	58	12	N	N	MAF L	ICT	ND	ICT	PUC	ND	ICT	S	EL	ADL LR	-	15	ICT	ATT	-
59	KAMALA	17411	20	27	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
60	SHANTHI	17695	15	9	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
61	KUPPU	17951	22	9	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	14	AA	-	-
62	ARUNDATHI	19599	17	27	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
63	SETTU	20579	18	24	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	9	CA	-	-
64	DASRATHAM	21590	38	11	N	N	N	PS ABS	PS ABS	ND	ND	ND	PS ABS	S	EM	I & D	-	10	-	ATT	-
65	YASODA	23198	47	44	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
66	KANNAGI	23435	39	22	N	AUD	AUD	ICT	ND	ND	ND	ND	ILEAL PERF ICT	S	EM	LR ILEOS	wound inf	28	ICT	ATT	-
67	ARUNA	23724	88	14	N	N	N	ICT	BW T	ND	PUC	ND	ICT	C	-	-	-	7	-	ATT	-

68	DEVI	26061	48	28	N	N	N	ICT	ND	ND	ND	ICT	ICT	C	-	-	-	9	-	ATT	-
69	SUJATHA	27308	56	28	y	N	N	CA CAEC UM	CAC AEC UM	ND	IFD	CA CAE CU M	CA CAECU M WITH KOCHS	S	EL	RRHC	-	14	MU AD	ATT CC	-
70	KARTHIK	32137	19	21	N	N	MAF L	ICT	ND	ND	ND	ND	ICT	S	EM	ADL bx	-	9	ICT	ATT	-
71	GOVINDAMMAL	33501	10	20	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	14	CA	-	-
72	CHINNARAJU	35778	24	13	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	Appendicec tomy	uneventful	7	AA	-	-
73	INDRANI	36788	13	21	N	N	N	App mass	ND	ND	ND	ND	App mass	C	-	-	-	6	-	NCF	NC S
74	VEERASWAMY	37230	42	22	y	koch s	MAF L	ICT	BW T	ICT	ND	ND	ICT	S	EL	ADL LR	wound inf	20	ICT	ATT	-
75	SHANMUGAM	37912	34	52	N	N	N	App abs	app abs	ND	ND	ND	App Abs	S	EM	Appendicec tomy	wound inf	9	AA	-	-
76	SUBRAMANI	38624	17	20	N	N	N	App mass	App mass	ND	ND	ND	App mass	S	EL	IA	uneventful	17	CA	-	-
77	ESTHER	39692	10	8	N	N	N	PAR SW	PAR SW	DES TU M	ND	ND	DES TUM	S	EL	WLE	-	10	DES TU M	-	-
78	JAYARAMAN	39694	15	14	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	13	CA	-	-
79	SEENU	39718	24	15	N	N	N	App mass	ND	ND	ND	ND	App mass	S	EL	IA	uneventful	15	CA	-	-
80	DAISY	40122	14	16	N	N	N	App abs	ND	ND	ND	ND	App Abs	S	EM	ID and IA	uneventful	9	CA	-	-

## KEY FOR MASTER CHART

Abd x-ray – Plain x-ray abdomen erect

AA - Acute appendicitis

ADL - Adhesiolysis

ATT - Antitubercular treatment

AUD - Air under the diaphragm

App abs - Appendicular abscess

App mass - Appendicular mass

AF-AFB - Ascitic fluid for Acid fast bacilli.

BWT - Bowel wall thickening

b - Business

C - Conservative

CC - Cancer chemotherapy

Ca - Carcinoma

Ca Ce - Carcinoma caecum

CA - Chronic appendicitis

CXR - Chest X-ray

CT - Computerised tomography

Coolie - Agriculture, mechanical and manual workers

CRP - C-Reactive protein

Des-Tum - Desmoid tumor

Duration - Duration / Days

ESR - Erythrocyte sedimentation rate

Evactn - Evacuation

F - Female



FNAC	- Fine needle aspiration cytology
Hb	- Haemoglobin
HPE	- Histopathological examination
hw	- House wife
ICT	- Ileo-caecal tuberculosis
ID	- Incision and drainage
IA	- Interval appendicectomy
IFD	- Irregular filling defect
Koch's	- Tuberculous lesion in chest x-ray
LR	- Limited resection
Loss wt/ap	- Loss of weight and appetite
LRI	- Lower respiratory tract infection
M	- Male
MAFL	- Multiple air fluid level
Mets	- Metastasis
MDAD	- Moderately differentiated adenocarcinoma
MUAD	- Mucinous adenocarcinoma
NCF	- Not came for follow- up
NCS	- Not came for surgery
ND	- Not done.
PAR-HEM	- Parietal wall haematoma
PS-Abs	- Psoas abscess
PUC	- Pulled –up caecum
RRHC	- Right radical hemicolectomy
Sep	- Sepsis

Size	- Size in centimetres
S	- Student/ Surgery.
TC	- Total leucocyte count
USG	- Ultrasonogram
WLE	- Wide local excision
Y	- Yes (present)
- -	- NIL